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MEDICINE AND SURGERY

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A Yearly Digest of Scientific Progress and Authoritative
Opinion in all Branches of Medicine and Surgery,
drawn from Journals, Monographs, and Text-
Books of the Leading American and Foreign
Authors and Investigators

COLLECTED AND ARRANGED

WITH CRITICAL EDITORIAL COMMENTS

BY

J. M. BALDY, M.D.,
J. CHALMERS D'ACOSTA, M.D.,
W. A. NEWMAN DORLAND, M.D.,
GEORGE FETTEROLF, M.D.,
JOHN H. GIBBON, M.D.,
VIRGIL P. GIBNEY, M.D.,

C. A. HAMANN, M.D.,
HOWARD F. HANSELL, M.D.,
BARTON COOKE HIRST, M.D.,
D. BRADEN KYLE, M.D.,
WENDELL REBER, M.D.,
J. HILTON WATERMAN, M.D.

UNDER THE GENERAL EDITORIAL CHARGE OF

GEORGE M. GOULD, M.D.

SURGERY



PHILADELPHIA, NEW YORK, LONDON

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CONTRIBUTORS.

- J. MONTGOMERY BALDY, M.D.,** PHILADELPHIA, PA.
Professor of Gynecology, Philadelphia Polyclinic; Surgeon to the Gyncecan Hospital, Philadelphia.
- J. CHALMERS D'ACOSTA, M.D.,** PHILADELPHIA, PA.
Professor of the Principles of Surgery and of Clinical Surgery, Jefferson Medical College, Philadelphia; Surgeon to the Philadelphia Hospital.
- W. A. NEWMAN DORLAND, M.D.,** PHILADELPHIA, PA.
Assistant Demonstrator of Obstetrics, University of Pennsylvania; Associate in Gynecology in the Philadelphia Polyclinic.
- GEORGE FETTEROLF, M.D.,** PHILADELPHIA, PA.
Assistant Demonstrator of Anatomy, University of Pennsylvania.
- JOHN H. GIBBON, M.D.,** PHILADELPHIA, PA.
Professor of Surgery, Philadelphia Polyclinic; Surgeon to the Out-Patient Department, Pennsylvania Hospital; Surgeon to the Bryn Mawr Hospital.
- VIRGIL P. GIBNEY, M.D.,** NEW YORK CITY.
Clinical Professor of Orthopedic Surgery, College of Physicians and Surgeons, New York City.
- C. A. HAMANN, M.D.,** CLEVELAND, OHIO.
Professor of Anatomy, Western Reserve University, Cleveland, Ohio.
- HOWARD F. HANSELL, M.D.,** PHILADELPHIA, PA.
Professor of Diseases of the Eye, Philadelphia Polyclinic; Clinical Professor of Ophthalmology, Jefferson Medical College, Philadelphia.
- BARTON COOKE HIRST, M.D.,** PHILADELPHIA, PA.
Professor of Obstetrics, University of Pennsylvania.
- D. BRADEN KYLE, M.D.,** PHILADELPHIA, PA.
Clinical Professor of Laryngology, Jefferson Medical College, Philadelphia; Consulting Laryngologist, Rhinologist and Otologist, St. Agnes Hospital; Bacteriologist to the Philadelphia Orthopedic Hospital and Infirmary for Nervous Diseases.
- WENDELL REBER, M.D.,** PHILADELPHIA, PA.
Associate in Ophthalmology, Philadelphia Polyclinic; Ophthalmologist to the Rush Hospital and to the Methodist Episcopal Orphanage.
- J. HILTON WATERMAN, M.D.,** NEW YORK CITY.
Clinical Assistant, Hospital for Ruptured and Crippled; Instructor in Surgery, New York Polyclinic.

PREFACE.

THE death of Dr. Charles H. Burnett and the resignations of Dr. Ingals and Dr. Ohls have allowed the union of the departments of Otology and Laryngology under the editorship of Dr. D. Braden Kyle and Dr. George Fetterolf. Subscribers interested in these specialties will be glad to have them brought in this way into their proper logical and clinical combination, and especially under the care of one so exceptionally fitted for the work as is Dr. Kyle. The continued success of these Year-Book volumes, despite so many old and new rivals, is a source of gratification to the editors.

GEORGE M. GOULD.

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GENERAL SURGERY.

BY J. CHALMERS DaCOSTA M.D., AND JOHN H. GIBBON, M.D.,
OF PHILADELPHIA.

SURGICAL TECHNIC.

Chas. McBurney¹ makes some interesting remarks concerning the **practice of aseptic surgery**. The aseptic surgeon is not alone satisfied with removing all the bacteria from everything which is to come in contact with the wound, but he also endeavors to avoid the creation of a single condition favorable to germ life, such, for instance, as the accumulation of blood-clot in the wound. McBurney strongly advocates the employment of thin rubber gloves, and considers them absolutely essential to the practice of aseptic surgery. Boiling renders gloves perfectly sterile. With a little experience the surgeon's sense of touch is not interfered with. Care should be taken to see that the glove fits perfectly. It is stated that the fingers of the surgeon who constantly employs gloves will always be free from the thick, horny epithelial layer which is so commonly seen on the hands of those who rely upon chemicals for sterilization. During the operation gloves can be more readily cleansed than can the surgeon's hands. Another advantage in the use of gloves is that the handling of the tissues produces much less damage than when the naked hands are used. During 5 years McBurney has done no operation with bare hands. The forearms of the surgeon should be covered with snug-fitting sleeves made of some sterile material so that the bare arms do not come in contact with the wound or instruments. The greatest care should be taken in the making of the wound, in its treatment, and in its closure, in order that no condition favorable to germ life may be produced. Knives should be sharp and incisions clean-cut; hemorrhage should be checked as soon as possible and blood-clot must not be allowed to accumulate within the wound. McBurney favors the use of moist sponges, as they do less harm to the tissue-cells than do dry sponges. He does not look with favor upon the employment of any chemical antiseptic in clean wounds, and for drainage employs plain sterilized gauze. In applying ligatures care should be taken that as little tissue as possible is constricted with the vessel. Careful approximation of corresponding parts should be made during the wound closure. The rules laid down for the practice of asepsis during the performance of an operation upon a sterile field should be employed with equal care when the

¹ N. Y. Med. Jour., Mar. 22, 1902.

field is septic, else a secondary infection may occur. It must be remembered that many wounds made in the removal of suppurating foci heal primarily if properly treated. McBurney treats a large number of his septic cases without the employment of a chemical antiseptic, with the single exception of hydrogen dioxid, which is used in weak solutions for the purpose of breaking up and removing septic material. The frequent dressing of septic wounds in order to prevent the accumulation of discharges is recommended. To prevent subsequent infection care should be exercised during the postoperative period. This care consists in aiding the circulation by the injection of salt solution into the rectum or into a vein; in immobilizing the field of operation; and in applying dressings which do not produce constriction of the part. In order to practise aseptic surgery thoroughly one must be convinced of its utility.

In an article on the **cause and prevention of stitch-abscesses** Maylard,¹ of Glasgow, recommends the sterilization of the skin by inunctions of oleate of mercury. The author speaks of the unsatisfactory results of all methods of sterilizing the surgeon's hands and the field of operation. Regarding the hands, Maylard strongly recommends their submersion for 5 or 10 minutes in water as hot as can be conveniently borne. The advantage of this is that it produces a dilation of the capillary vessels and excites the secretion of the skin glands, and in this way prevents subsequent secretion during operation. He says that "soaking is better than soaping." Maylard's method of sterilizing the skin has been tested chemically, bacteriologically, and clinically, a portion of the skin being removed and submitted to the various tests. The conclusions from these experiments are as follows: "(1) The chemical examination failed to afford any positive information. Either the mercury was in too small quantity to be detected, or its absorption and transit through the lymphatics too rapid to be caught for analysis. (2) The bacteriologic examination proved a material diminution in the number of microorganisms present. That any should be present at all is probably to be explained by the fact that the ointment cannot reach all the seats where they exist. Thus, microorganisms located in the hair-follicles, or in the ducts of the sebaceous or sudoriferous glands, cannot be reached by the process of inunction; and therefore, when fragments of skin containing them are embedded in nutrient media, they soon discover a soil upon which they can develop. (3) The clinical records seem to afford incontestable proof of the value of the method. That microbes were in all probability present in the tissues operated upon, and yet failed to develop into a pathologic process, is, he believes, thus explained. The sterilizing effect of the inunction is productive of two results—it kills every organism in the lymphatic channels, and so influences the living tissues that they can successfully inhibit the further development of those which remain."

The method is employed as follows: "(1) Cleanse the skin in the usual way by soap and water (turpentine and alcohol, or ether, if necessary). (2) Anoint freely and widely with hydrated lanolin-oleate of mercury (20 %) and rub in; besmear a piece of lint with the same and leave on

¹ Ann. of Surg., Jan., 1902.

until a second incision is performed 12 hours later. Every case should be treated for at least 24 hours before operation; preferably 48 hours should be given, with at least two separate periods of 'rubbing in' for about 10 minutes on each occasion. (3) On the operating-table the piece of lint is removed, and the superfluous ointment rubbed off with a piece of sterilized gauze. The part is now ready for operation."

Christian Fenger¹ advises the employment of a loop around the hyoid bone, as an aid in narcosis during certain operations on the lower jaw in the mouth, and as a safeguard in after-treatment. Fenger lost a patient from asphyxia, the result of the dropping-back of the tongue during sleep after a resection of one-half of the lower jaw. Since this occurrence the author always leaves a loop of silk or silver wire attached to the anterior portion of the divided jaw, so that in case of necessity this

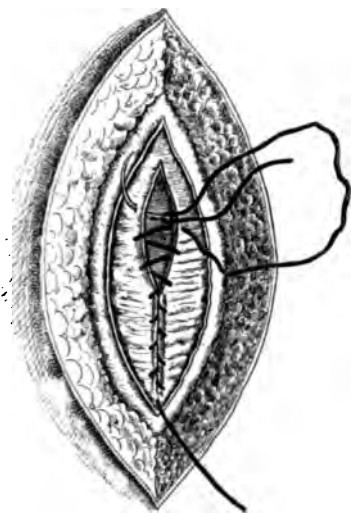


Fig. 1.—Suture of peritoneum (Davison, in Ann. of Surg., Mar., 1902).

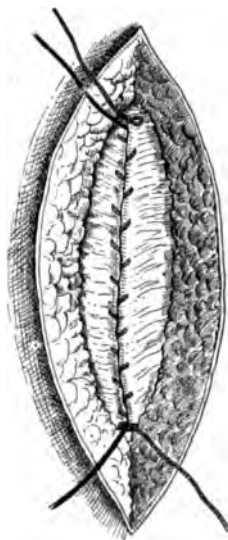


Fig. 2.—Suture of linea alba, tied in position (Davison, in Ann. of Surg., Mar., 1902).

bone and the tongue with it can be drawn forward. Of course this precaution is of use only when the muscles from the jaw to the hyoid bone are intact, or intact at least on one side. From experiments on the cadaver Fenger has found that the most effective method of keeping the air-passages free from obstruction of the kind mentioned is to be found in traction of the hyoid bone. When the muscles attached between the jaw and the tongue and hyoid bone are divided, it is recommended that a loop of silk be passed around the body of the hyoid bone through a small longitudinal incision in the soft parts. This tractor can be made use of during the operation by the operator or anesthetist if occasion should arise. At the completion of the operation the loop is attached to a plaster-of-paris cast loosely covering the field of operation, enough tension being placed

¹ Ann. of Surg., Jan., 1901.

upon it to prevent any sinking back of the base of the tongue. The loop is removed 3 or 4 days after the operation if the patient at this time is able to breathe comfortably with the head in any position.

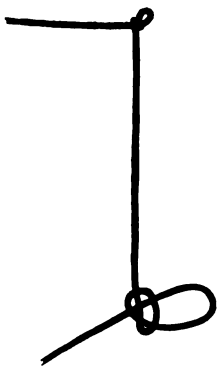


Fig. 3.—Diagram of knot (Davison, in *Ann. of Surg.*, Mar., 1902).

Chas. Davison¹ describes a method of **suture of the abdominal wall** which he has employed with great satisfaction. Each layer of the abdominal wall is approximated by a continuous silkworm-gut suture, the ends of which are allowed to protrude from the end of the wound, to be removed by traction when healing is complete. As the silkwormgut dries in the tissues it straightens, and its removal is accomplished with very little difficulty. The peritoneal and subcuticular sutures require no knotting, but that of the fascia is held by the knot shown in the accompanying illustration (Fig. 3). Davison has employed this suture also in a number of hernia operations where he has used a continuous mattress suture. The advantages of the method and the results obtained

are as follows: (1) Certainty that all suture or ligature material placed in the wound has been made sterile by boiling in water; (2) accurate layer approximation of tissue; (3) removal of the buried sutures when healing is complete; (4) capillary drainage from each layer; (5) safety of intestines from injury during the application of the sutures; (6) rapidity of application; (7) minimum line of irritation on the peritoneal surface and consequent adhesions to the viscera; (8) slight scar in the skin, there being no perforation of the skin by sutures; (9) all the advantages of a permanent buried suture without the danger of future irritation and extrusion of the knot; (10) the advantages of an absorbable suture without the danger of sepsis from the suture, and without producing a nidus for septic germs from the blood-current during absorption.

In the 7 months following January 3, 1901, the date of the initial use of the knot, he has used this method in 11 median laparotomies, in 8 appendicectomies, in 4 ventral herniotomies, and in 17 inguinal herniotomies, all of his abdominal operations that were closed without drainage, and obtained sterile primary union in every case. The



Fig. 4.—Suture of the superficial layer (Davison, in *Ann. of Surg.*, Mar., 1902).

¹ *Ann. of Surg.*, Mar., 1902.

most recent of these cases has gone 6 weeks since operation and is safe from suppuration. The claim for originality which is maintained is not in the use of a longitudinal suture, but in the tight and secure tying of a buried longitudinal suture which can be easily removed when healing is complete.

The **advantages and disadvantages of drainage after abdominal operations** are discussed by Hunter Robb,¹ who says it was formerly his custom to employ drainage after certain abdominal operations, but that gradually he has abandoned the use of the drainage-tube. Out of 222 consecutive cases only one was drained, that one being a pus case where it was impossible to remove the entire abscess-wall. Of these 222 cases, 28 % were pus cases. The author states that his immediate results have not only been better, but that his remote results have been much more satisfactory since the abandonment of drainage. [We do not feel that it is wise to abandon drainage in acute suppurative conditions. Robb uses gauze drains if there is persistent oozing of blood, if there is general peritonitis, if there is rupture of the bowel, if the pancreas was injured, if septic matter has flowed into the abdominal cavity, when areas of necrosis cannot be removed or when septic material cannot be thoroughly got rid of, and when we fear a damaged intestine may rupture or a line of suture in a viscus may leak. The value of drainage in many operations upon the gall-bladder and bile-ducts has been, in our opinion, amply demonstrated. It is always a misfortune to be obliged to drain, and unpleasant or disastrous consequences may ensue, but we believe that in many cases we are obliged to drain in order to save life. The tendency of the day is to drain fewer and fewer cases, and we believe it a wise tendency, but this is a very different thing from draining none at all. As a surgeon's experience broadens he is apt to drain less often; in other words, he comes to learn more accurately when to do it. A young operator will get in less serious difficulty if he drains in doubtful cases than if he does not. He will have more postoperative hernias and fewer deaths.]

Robt. T. Morris,² reports **experiments made with Cargile membrane for the purpose of determining its value in preventing the formation of peritoneal adhesions**. The membrane chosen by Dr. Cargile is a particularly thin goldbeater's skin made from the peritoneum of the ox and submitted to heat-cumol sterilization. Morris has employed this membrane in a number of cases with apparently perfectly satisfactory results, but to prove the true action he had 12 experiments conducted on rabbits, and concludes that the membrane "seems to resist absorption in the peritoneal cavity for more than 10 and less than 30 days." Its presence apparently causes the formation of temporary loose adhesions, which are harmless, and which become absorbed for the most part in less than 30 days. The membrane seems to cause very little disturbance to the peritoneum, it does not furnish a good culture-medium for bacteria, and it protects areas of peritoneal surface that have suffered injury to their endothelial covering, until new endothelial cells have repaired the injury without involving neighboring peritoneum. It is not

¹ Jour. Am. Med. Assoc., July 6, 1901.

² Med. Rec., May 17, 1902.

necessary to suture the membrane in place, as it becomes instantly adherent to moist surfaces, and is not readily dislodged afterward. In this connection it may be well to give warning against handling the material with wet hands or instruments. Morris has also employed the membrane in other situations than the peritoneal cavity, and finds it generally useful in preventing adhesions. For instance, it keeps surgical dressings from sticking to a wound. If dressings stick to a wound, when they are lifted off quantities of new cells are lifted off with them and healing is delayed. [If further experience demonstrates that this membrane by its presence causes only loose and temporary adhesions, we will be very greatly aided in intraabdominal and cerebral surgery.]

Fränkel¹ deals with the **treatment of wounds after operation for localized tuberculosis**. The local treatment of these wounds is important, as frequently all of the disease cannot be removed and the rigid wall of the cavity remains, and also because of the general condition of the patient and the lowered local resistance. Fränkel has carried out extensive histologic examinations to discover the relative value of iodoform and other indifferent powders, such as bone-charcoal, wood-charcoal, lycopodium, etc. The latter powders sometimes were sterilized and sometimes were not, and it was found that the tissues behaved in exactly the same manner under the influence of iodoform and of the nonsterilized indifferent powders. All of the powders produced stimulation of the fixed cells and fibroplastic proliferation. The idea that iodoform acts by slowly setting iodine free is combated by the fact that little or no iodine is excreted by the urine or found in the organs. Another fact which opposes this idea is that the sterilization of iodoform at a high temperature deprives it of the iodine and yet does not interfere with its usefulness. The only difference between the reaction of the tissues to iodoform and to the other powders is that iodoform produces an inflammatory reaction which is valuable in tuberculosis. This reaction to the fibroplastic proliferation can also be obtained with other agents. The value of iodoform in cases of tuberculosis is purely its mechanical action. Fränkel has substituted for iodoform pure sterile bone-carbon, which is employed as an emulsion in glycerin, as a pure powder rubbed into the tissues after the control of all oozing, or which is applied upon gauze packing. The results obtained by the use of this preparation were identical with those obtained by iodoform. When the author was able thoroughly to remove the disease, the entire wound-surface was thoroughly treated with the carbon and the wound closed. In these cases primary union without fever was the rule. [Fränkel asserts that iodine is not found in the urine when iodoform is used, and draws from this assertion the deduction that iodine is not given off from iodoform in the tissues; and yet it is well known that in iodoform-poisoning iodine does appear in the urine, and it has been stated that it may even be found when no toxic symptoms exist.]

The treatment of septic and suppurating wounds by pure carbolic

¹ Verhandl. der deutsch. Gesellsch. f. Chir., XXX Kongress; Centralbl. f. Chir., No. 29, 1901.

acid is discussed by Hansel¹ and the results of extensive experiments upon the lower animals are presented. It is a well-known clinical fact that general intoxication is more apt to follow the use of dilute solutions of carbolic acid than the employment of the pure agent. To test this, in his experiments Hansel injected into rabbits, subcutaneously, intraperitoneally, and into the rectum, both the pure acid and solutions of it. In each of these experiments it was found that more of the pure carbolic acid could be injected than of the weak solutions before any toxic effects set in. Prolonged application of a dilute carbolic acid solution produces gangrene, and the same result follows a more prolonged application of the pure acid. Hansel's experiments show that alcohol is capable of extracting more carbolic acid from the tissues than is water, hence it follows that the caustic effect of carbolic acid can be obviated by combining it with alcohol. Bichlorid of mercury is more strongly germicidal to bacteria suspended in solutions free from albumin than is pure carbolic acid, but if albumin is present in the solution containing the germs, the carbolic is more actively germicidal than is the sublimate. Hansel also experimented upon infected granulating surfaces in rabbits to determine the relative value of carbolic acid and bichlorid. When such surfaces are submitted to washings with carbolic-alcohol, it is rare to find subsequently any growth of bacteria; but if bichlorid is used in the same manner, growths can invariably be obtained. The author is a strong advocate of the employment of carbolic-alcohol treatment. In cases of cellulitis and abscess-formation its use gives most satisfactory results. Its employment in tuberculous cases, however, is of value only when pus-producing microorganisms are also present. In treating granulating wounds any thick layer of granulation tissue which may be present should be removed before completing the treatment. [Von Bruns has recently advocated the use of carbolic acid in infected wounds. He points out a fact we have repeatedly observed—viz., that if a wound is swabbed with pure carbolic acid and then washed with alcohol, the wound secretion is greatly diminished and the frequency with which dressings must be changed is correspondingly lessened.]

Hugh Cabot² has conducted numerous experiments to determine the **absorbability of the different sizes of catgut**. The author's acquaintance with a number of instances in which catgut was discharged from sinuses weeks after its introduction as a ligature or suture material led him to make the investigation. No. 1 chromicized catgut, when introduced without tension as a suture material, will remain in the tissues from 3 to 4 weeks. Larger sizes remain unnecessarily long and are apt to give rise to trouble. The process of cell-proliferation produced by the absorption of the catgut is observed to result in the formation of more scar-tissue when used in the skin than occurs from the use of nonabsorbable materials. More than two knots should be placed in catgut sutures and ligatures in order to insure their holding. The ends of catgut ligatures should be left from $\frac{1}{4}$ to $\frac{3}{4}$ of an inch long.

¹ Beiträge zur klin. Chir., Bd. xxx, Heft 2.

² Boston M. and S. Jour., Mar. 27, 1902.

C. A. Ball¹ sterilizes catgut by first placing it in a 5 % solution of formalin for 24 hours after winding it on glass spools. It is then boiled in water for 5 or 10 minutes, and finally is stored in a solution of bi-chlorid of mercury 1 part, glycerin 250 parts, and methylated spirits 1000 parts. The glycerin and spirit dehydrate the gut, the glycerin also renders it pliable, and the mercury hardens it.

Pollock² has conducted extensive experiments to discover the best method for **disinfecting cutting instruments**. He concludes that boiling in a solution of soda in a closed vessel is the best method of sterilization, but it is objectionable because it blunts sharp instruments. Soap spirit (spiritus saponis kalinus) was found to destroy the ordinary pyogenic organisms in 15 minutes without damage to the instruments. Mechanical rubbing with soap spirit for 30 seconds is commended, and the author states that it has proved perfectly satisfactory in practice.

Crile³ has performed numerous experiments upon animals to determine the **exact effect upon the various organs and their functions of the intravenous infusion of saline solution**, and he compares these experimental results with those which have been noted clinically. He shows that the employment of saline solution intravenously can but temporarily and partially restore the blood-pressure when there has been a breakdown of the vasomotor mechanism, and reports a case showing the futile employment of this agent in the presence of violent shock. Vasomotor breakdown is an impairment which is equally unaffected by drugs. When the vasomotor mechanism is impaired but not destroyed, the benefit of saline infusion is due to the force added to the venous circulation. The venous pressure falls *pari passu* with the diminution of

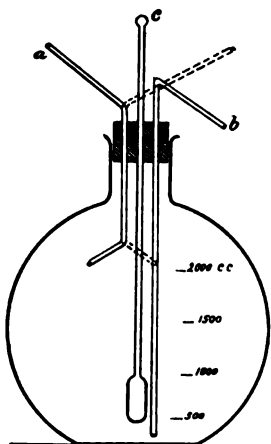


Fig. 5.—Wainwright's infusion apparatus. *a*, Air-vent tube; dotted lines show the position to which it is twisted when the cork is inserted; *b*, delivery tube; *c*, thermometer.

the peripheral resistance (vasomotor impairment, shock), so that the saline infusion supplies to the venous blood-pressure the force which the decreasing peripheral resistance does not ordinarily supply.

Wainwright⁴ offers a simplified **infusion apparatus**, which is shown in the accompanying illustration (Fig. 5).

AMPUTATIONS.

Gallet⁵ records 2 cases in which he **removed the lower extremity with the ilium**, operating in one for extensive caries of the pelvis and in the other for osteosarcoma involving the pelvis and femur. Both patients

¹ Brit. Med. Jour., Nov. 16, 1901.

² Deut. med. Woch., No. 36.

³ Med. News, May 3, 1902.

⁴ Med. Rec., Aug. 3, 1901.

⁵ Jour. de Chir. et Ann. de la Soc. Belge de Chir., No. 7, 1901.

died from shock immediately after the operation. The high mortality of this operation is shown by the fact that 8 out of 11 reported cases proved speedily fatal. The author nevertheless thinks that the operation has its indications, and that with improved technic and methods the results of the future will be better than those of the past. He does not think that the deaths reported were in any way due to the loss of blood.

Sheldon¹ recommends a modification of Senn's method of producing **hemostasis in disarticulation of the hip-joint**. The operation suggested consists in the disarticulation of the upper end of the femur; the freeing of the upper part of the bone from its muscular and ligamentous attachments; the clamping of the femoral vessels by means of forceps introduced into the wound behind the femur; the formation of the flaps and removal of the limb; and, lastly, the ligation of the vessels and closure of the wound. The disarticulation is accomplished through a vertical incision made over the great trochanter. When the upper portion of the bone has been freed from its muscular attachments and disarticulation accomplished, the femoral vessels are located by means of one hand applied over them in the groin and two fingers of the other hand introduced into the wound behind the femur. The vessels will be found close to the acetabulum just external to the iliopectineal eminence. The fingers should be passed between the pectineus and iliopsoas muscles, when they will come in contact with the vessels. When the vessels have once been located, they can be readily clamped with an artery forceps. After the control of the femoral artery but slight hemorrhage will occur in the formation of the flaps. After ligating all bleeding vessels Sheldon advises approximation of the flaps by means of a large silk mattress suture through the thickest part of the flaps. A gauze compress is placed between the skin-flaps and each loop of the suture to prevent cutting or necrosis of the skin. The suture is left long and a knot tied which can be easily loosened. It is claimed for this suture that it holds the flaps together, thereby relieving the cutaneous sutures from tension; that if suppuration occurs the cutaneous sutures can be removed without the entire separation of the flaps; and that if deep infection of the wound occurs the suture can be loosened sufficiently to allow free irrigation and later tightened, thereby producing a re-approximation of the flaps. Because of these advantages this suture is thought to be more valuable than the buried catgut sutures. The author reports briefly 4 cases of hip-joint amputation. In the last case he employed with great satisfaction the method described for producing hemostasis.

Edmund Owen² states that in his opinion **amputation of the hip-joint** is most conveniently performed **after preliminary ligation of the common femoral vessels**. Then a circular incision a little above the middle of the thigh is made and the femur is enucleated through an incision running down onto the bone from the top of the great trochanter.

W. G. Spencer³ reports an interesting case of **amputation through the thigh**. The patient was a **chronic diabetic** who developed necrosis

¹ Amer. Med., April 10 and 19, 1902.

² Lancet, June 28, 1902.

³ Lancet, Mar. 22, 1902.

of the foot. The amputation was followed by the disappearance of the glycosuria. The disappearance of the glycosuria was possibly aided by the diet and drugs, though these apparently produced no benefit previous to the removal of the diseased extremity. [The disappearance of sugar after amputation for diabetic gangrene has been noted by Küster.]

Robert H. Cowan¹ deals with the subject of **amputations**, discussing it particularly from a railway surgeon's point of view. In speaking of the remarkable resistance often exhibited by the soft tissues in railway accidents, he refers to a case in which a heavily loaded car passed over the upper part of the abdomen. There was but slight abrasion of the skin, although death resulted in a very few minutes from a complete severing of the spinal column. Cowan strongly opposes immediate amputation in cases of injury. It is believed that in every case the patient should react from shock before the operation is undertaken. The intravenous and intracellular injection of hot salt solution is probably the most valuable means we have for combating shock. It is extremely difficult to tell immediately after the injury how much of the tissue will live, so that if immediate amputation is done a limb may be sacrificed, whereas a reasonable delay may convince the surgeon that the tissues possess sufficient vitality and reparative power to warrant at least an attempt to save the part. And, again, if immediate operation is done the surgeon may find that he has amputated too low, and tissue which he thought would survive becomes gangrenous. Although generally all the tissue possible should be saved, occasionally it is better to go a little higher than the injury would indicate in order to provide the patient with a stump that will afford the greatest possible use. For instance, it is better to amputate just above, rather than at, the knee-joint. The author has employed cocaine in 25 major amputations with the greatest satisfaction. In cases of traumatism requiring amputation between the joints the circular method is advised. The use of silk is condemned for the ligation of arteries. Great care should be observed in the ligation of arteries to avoid the inclusion of nerves. The transfixion operation is to be advised only in those cases of disease in which we fear sloughing of the flaps because of impaired circulation. Sloughing is particularly apt to occur in diabetics. The flaps should not be closed until the wound is perfectly dry, when a dry sterile dressing should be applied without drainage. Through-and-through sutures of silkwormgut passing through both flaps should be employed for the purpose of obliterating any dead space. After these are introduced the edges of the flaps may be approximated by interrupted sutures. [We believe Cowan is entirely right in opposing amputation until the patient has reacted from shock.]

Lauenstein² strongly opposes the practice of drawing out tendons and cutting them off in **amputations of the fingers** for injury. The author believes that this practice is responsible for the frequent occurrence of suppuration in the palm and along the sheaths of the tendons. It is believed that the tendon when drawn down and divided becomes infected, and the infection is carried up into the tendon-sheath. The practice of

¹ Phila. Med. Jour., Sept. 28, 1901.

² Centralbl. f. Chir., No. 41, 1901.

dividing tendons above the line of amputation is thought to be not only useless but dangerous. [We believe that when infection follows it is due to the formation of a primary focus in the wound and the spread up through the open theca. When the theca is carefully sutured, suppuration of the tendon-sheaths is usually avoided.]

ANTHRAX, ACTINOMYCOSIS, TETANUS, ETC.

Sturdy,¹ of Bradford, reports an interesting case of **anthrax with extensive meningeal hemorrhage**. The patient was a wool-sorter, aged 33, who suffered from a severe attack of anthrax, the initial lesion being situated on the right side of the neck. The gangrenous area was excised and the adjacent tissue was injected with carbolic acid solution. Next day the patient became blind, complained of great pain in the head, in a short time became unconscious, and died in a few hours. The pericardium contained 1½ ounces of serum and both pleural cavities also contained serum. There was a large quantity of blood found between the arachnoid and the pia mater. The brain itself appeared normal. [Now and then cases of anthrax are reported. Jopson, in a paper before the Philadelphia Academy of Surgery, showed that the disease is more common in Philadelphia than has been supposed. Unfortunately it is rarely recognized in time to save the patient's life. For 2 or even 3 days there may be no general symptoms and the patient is apt to regard the local lesion as trivial. The injection of carbolic acid about the pustule seems to be the most useful treatment. T. S. Dabney² reported a case of anthrax cured by injecting carbolic acid in and about the pustule and swabbing the area with pure carbolic acid.]

John H. Bell³ discusses **edematous and erysipelatous anthrax** and reports 5 cases occurring in the Bradford worsted district, where the disease affects both man and animals with greater frequency than in any other part of Great Britain.

Alexander Scott⁴ discusses the **danger of anthrax from the manipulation of horsehair and its prevention**. He reports a case of a woman aged 24 who was a cleaner in the show-room of a cabinet-maker's warehouse. The patient died on the tenth day of her illness. Although the lesion first appeared on the left cheek, at the postmortem examination cultures of the anthrax bacillus were obtained from the pericardial fluid, ascitic fluid, spleen, and heart-muscle. Malignant pustules of large size were also found in the stomach and smaller ones in the intestines. The patient's brother stated that she was in the habit of chewing the hair. The prevention of the disease, it is thought, may be accomplished by keeping the horsehair wet during its manipulation in order to prevent the dissemination of the germs by the air; and by boiling the hair for 30 minutes in a 2 % solution of potassium permanganate, and bleaching it subse-

¹ Brit. Med. Jour., July 20, 1901.

² New Orleans M. and S. Jour., Aug., 1901.

³ Brit. Med. Jour., July 20, 1901.

⁴ Brit. Med. Jour., July 20, 1901.

quently by a 3 % solution of sulfurous acid. The boiling suggested by the author will result in the destruction of the germs but will not destroy the spores; in order to accomplish their destruction a greater degree of heat is required, which will result also in the destruction of the hair.

Wherry¹ reports a case of **so-called malignant (staphylococcus) carbuncle of the upper lip followed by pyemia** which resulted in death within about a week from the primary infection. The carbuncle is supposed to have originated from the extraction of a "dead hair" from the upper lip. The day following the patient's lip was enormously distended, and the swelling rapidly increased, involving the right side of the face and eye. The patient died from pyemia 24 hours after admission to the hospital, the temperature before death reaching 108.2° F. In addition to multiple abscesses, the patient had hemorrhagic pneumonic areas in the lungs, double fibrinopurulent pleuritis, beginning pericarditis, pericardial ecchymosis, abscess of the spleen, acute splenic swelling, and cloudy swelling of the kidneys and liver. A persistent thymus was found. From the lip, heart's blood, pleural exudate, lungs, liver, and spleen pure cultures of *Staphylococcus pyogenes aureus* were obtained. Carbuncles in this situation differ from those in other parts because of the absence of fibrous bands binding the skin down to the muscular layer. Thrombosis and embolism are especially likely to occur in the upper lip on account of its great vascularity. Thrombosis of the facial vein is a frequent complication, and may result in an extension to the sinuses of the dura mater.

Vandever and Elting² present a most complete résumé of the subject of **actinomycosis** and report a case of **actinomycosis abdominalis**. Reference is made to the history and literature of the subject and to the behavior of the microorganisms. Actinomycotic lesions are divided into the neoplastic type, which is usually found in horses and cattle, and the inflammatory type, usually found in man and hogs. In the former type a spontaneous cure is not infrequent. The inflammatory type tends to the production of sinuses but does not form large abscess-cavities. Muscles and bone do not afford a very favorable medium for the development and extension of actinomycotic foci. The formation of fistulous tracts is quite characteristic of the disease, but the discharge from them varies greatly. Secondary infection of these tracts exists practically always. Poncet and Berrard divide the disease into cervicofacial, thoracic, abdominal, and cutaneous, other foci being regarded as complications. Statistics show that 55 % of the cases are of the cervicofacial type, 20 % thoracic, about 20 % abdominal, and 5 % of a variety of types. There has been no well-authenticated case of primary abdominal actinomycosis which did not originate from the gastrointestinal tract. Actinomyces gain access to the stomach through either animal or vegetable food; usually the latter. Intestinal actinomycosis begins as a small nodule in the submucosa, which later ulcerates. Intestinal adhesions form, but the abdominal viscera or the abdominal wall by becoming adherent prevent perforation into the general peritoneal cavity. Retroperitoneal abscesses occasionally result from ulcers occurring in portions of the intestine not

¹ Amer. Med., Jan. 4, 1902.

² Phila. Med. Jour., Dec. 28, 1901.

provided with a mesentery. Cases have been reported in which the intestine has become adherent to the abdominal wall and perforated, resulting in a fecal fistula. A few cases of perforation into the bladder have been reported. The pelvic viscera have also been involved in a few instances. Grill was unable to find a single authentic case where abdominal actinomycosis had extended through the lymph-channels. Metastases take place usually through the veins. Among the secondary lesions of abdominal actinomycosis those of the liver are the most frequent. In 50 % to 60 % of the abdominal cases the primary focus is the cecum, the appendix, or contiguous portions of the colon or ileum. Grill divides abdominal actinomycosis into three typical periods: the initial period, the period of tumor-formation, and the period of fistula. To these Hinglais has added the period of repair. Pain is usually present, but to a slight degree. Spontaneous recovery is possible even though there be an extensive infiltration of the abdominal wall with the formation of numerous fistulas. The disease may last from a few weeks to several years. A considerable number of cases of abdominal actinomycosis have recovered. The abdominal cases are more hopeful than the thoracic ones because they are more amenable to surgical treatment. In 77 cases of abdominal disease treated surgically Grill found 22 recoveries, 10 improvements, and 45 deaths. A diagnosis during the initial period is difficult, but after the period of tumor-formation and after the fistulas have become established the diagnosis is comparatively easy.

In the treatment of this condition there is no specific, although iodid of potassium possesses certain qualities which produce a favorable result. A number of observers have reported that men and animals infected with actinomycosis react to Koch's tuberculin in the same manner as do cases of tuberculosis. Medication should be combined with the careful exploration of the fistulas and the excision of the foci as far as possible. Because of the great possibility of the recurrence of the disease patients apparently cured should be watched for several years.

The case reported is that of a man 45 years of age who was admitted to the Albany Hospital with a provisional diagnosis of sarcoma of the cecum or mesentery. The patient's illness began several months before admission with pain in the stomach, which was not relieved by rest and treatment, but which gradually disappeared after 8 weeks. No abdominal lesion at this time could be discovered. The patient became well enough to return to his work and regained his normal weight, but after a quiescent period of about a month he noticed a small tumor in the region of the umbilicus. This proved to be of inflammatory character, evidently containing pus. Examination, however, revealed a tumor in the right iliac region which was supposed to be a sarcoma. The abdomen was opened and a tumor about half the size of a fist was found attached to the right iliac crest. A hard portion of the peritoneum could be traced to the umbilicus and externally at this point there was the abscess because of which the patient had come to the hospital for treatment. The abdomen was closed, and later the abscess was opened and drained. Through a mistake a specimen of the tumor was lost and a diagnosis of actinomycosis was not made

until some time later, when the discharge was examined and found to contain actinomycetes. Later in the course of the disease other abscesses developed in the abdominal wall, which required opening. The patient's general condition improved and he was discharged from the hospital but continued to take large doses of iodid of potassium. Four months after the operation some of the sinuses had closed. About this time the patient developed a pimple on his nose which was squeezed by his wife. Forty-eight hours later pain and swelling about the nose took place and gradually increased until a tumor the size of a hen's egg developed. The mass broke and discharged considerable pus. This discharge was found to contain actinomycetes. Seven months after the original operation the patient was greatly improved, the abscess on the face having healed and the abdominal condition being much better. A month later still greater improvement took place. [In endeavoring to make a diagnosis in a doubtful case it is necessary to bear in mind that for considerable periods of time the ray fungus may be absent from the discharge and may even be undiscoverable in the tissue of the lesions, and also that tuberculosis may exist in an individual with actinomycosis.]

Two cases of **tetanus following aseptic celiotomy** are reported by H. C. Coe.¹ No case of tetanus developing after an abdominal operation has been found in the records of the Bellevue Hospital and not one has occurred in the Woman's Hospital during the past 13 years. The first case reported was operated upon for double pyosalpinx. The patient made a good recovery from the operation, but on the sixteenth day developed trouble in swallowing and a stiff neck. She died on the thirty-sixth day after the operation and the twentieth day after the appearance of the initial symptoms. The second patient was operated upon for an ovarian cyst. She also made a satisfactory recovery from the operation, but on the ninth day developed symptoms of tetanus and died on the eleventh day. In the first case 25 cc. and in the second case 40 cc. of tetanus antitoxin were employed. It is worthy of note that another patient was operated upon at the same time, in the same operating-room and under the same conditions as was the second reported case, and no tetanus developed.

F. L. Taylor² presents brief histories of **5 cases of tetanus**, and after reporting his experience in a large out-patient surgical service quotes extensively from the literature of the subject, particularly regarding the treatment of tetanus with antitoxin. During the fortnight preceding July 4, 1899, 32 wounds from the wads of toy pistols were treated at the Hudson Street Hospital; 3 of these died from tetanus; in none of the cases would the patient consent to a thorough cleansing of the wound. During the same period in 1900, 27 similar wounds were treated at the same institution, and all were freely incised and cleansed and then swabbed with pure carbolic acid, followed by alcohol and a wet dressing of carbolic acid, 1:80. In 14 of these cases prophylactic injections of antitetanic serum were administered. None of these 14 developed tetanus, but of the remaining 13 not injected, one case developed tetanus and died.

¹ Am. Gyn. and Obst. Jour., Dec., 1901. ² N. Y. Med. Jour., July 20, 1901.

Taylor believes that it has been definitely shown that, although not curative, the antitetanic serum is a prophylactic. [In Paris particularly, prophylactic treatment enjoys a certain popularity, and some surgeons inject antitoxin if it seems probable that earth has entered into the wound. In a debate in the Paris Surgical Society¹ it was made clear that in practically all accidents earth must enter, at least as dust, and that such treatment cannot be universally applied. Most surgeons think that careful cleansing of a wound is enough, remembering that a punctured wound cannot be cleansed unless it is converted into an incised wound. Toy pistol wounds are so dangerous that it is proper to use antitoxin as a prophylactic in such cases, if we believe in the value of the plan. The prophylactic influence seems more certain than the curative power.]

In a **summary of 4 cases of tetanus following the employment of gelatin injections**,² the first case is reported by Gerulanos, the second by Georgi, and the third and fourth by Lorenz. In each of these cases the injection was employed for the control or prevention of hemorrhage. In none of the cases was it absolutely proved that the source of infection lay in the gelatin. [It is vitally important to determine positively if gelatin contains bacilli or spores of tetanus, and, if it does contain them, if they can be killed without impairing the usefulness of the gelatin. Tetanus bacilli were found in 4 out of 6 specimens of commercial gelatin by E. Levy and H. Bruns.³ It is maintained by most authors that boiling for 8 minutes will kill the spores of tetanus, but Levy and Bruns assert that longer boiling is required, and it is important to know how far, if at all, longer boiling will impair the coagulating power of gelatin upon the blood. If we must boil the gelatin so long that to render it safe we make it useless, the method will have to be abandoned. The safest way to prepare it is by fractional sterilization, as Sailer⁴ advises.]

E. Mackey⁵ reports 3 interesting cases of **traumatic tetanus** which recovered after the **use of antitoxin**. The first patient was a boy of 15, a gardener, who developed tetanus two weeks after having a finger crushed by a barrel of manure. This patient received in all 10 injections of the antitoxin, making a total of 116 cc. He made a perfectly satisfactory recovery. The second case was a man 49 years of age, a bricklayer, who had a splinter from his barrow pierce his hand. The symptoms appeared two weeks after the injury. Sixteen injections were given, making a total of 131 cc. of the serum. The third case was a young man 19 years of age, a bricklayer, who four days after the previous case ran a splinter under his nail from the handle of the same barrow. The symptoms developed in this case ten days after the injury. This patient recovered after 13 injections, making a total of 105 cc. of the serum. Mackey states that these are not selected cases, but that they are all which have come under his care since the introduction of the antitoxin treatment. He calls attention to the fact that the period of incubation in none of the cases was short. He was much impressed by the action of the

¹ Gaz. des Hôp., July 16, 1901.

² Centralbl. f. Chir., Jan. 18, 1902.

³ Deut. med. Woch., Feb. 20, 1902.

⁴ Therap. Gaz., Aug., 1901.

⁵ Lancet, Nov. 9, 1901.

serum, and notes that upon the suspension of the injections the spasms increased, and were again controlled when the injections were renewed. In all these cases a small amount of sedatives was employed. [The long period of incubation in each case indicates that the chance of recovery under any treatment was much better than if the incubation had been brief. Four cases have been reported as cured by the intracerebral injection of antitoxin.]

Two cases of angina ludovici are reported by Ross.¹ The first case originated in necrosis about a wisdom-tooth. The symptoms progressed so rapidly that 12 hours after the onset operation was imperative. The tooth was pried away from the second molar, and fetid gas and pus escaped. The inflamed tissue in the submaxillary region was then freely incised. Great improvement followed this operation, but the symptoms recurred a few weeks later. The tooth was then chiseled out. The second case developed after a toothache which had lasted for 4 days. At this time the submaxillary region began to swell and dyspnea developed. The edematous sublingual tissue was excised, which greatly relieved the dyspnea. The next day, however, the edema extended as high up as the zygoma and down as far as the midsternum. At this time the abscess was drained by an incision extending through the muscles of the floor of the mouth. During the operation the patient ceased breathing and tracheotomy became necessary. Five days after this operation another abscess on the right side of the face was drained. As a result of the inflammation of the larynx, aphonia resulted. Examination of the blood of this patient showed it to be sterile when introduced into the bouillon and agar tubes. The pus, however, showed both staphylococci and streptococci. Pathologic findings indicate that the disease is in all probability erysipelatous in character, and therefore a sufferer from it should be isolated. Both of Ross's patients recovered.

Buchan² reports a case of **dry gangrene occurring in scarlet fever**. The condition is rare, and is usually bilateral and symmetric, which fact demonstrates that it is not of embolic origin. The condition is probably due to a gradual narrowing of the vessel, the result of thrombosis. The case reported is that of a boy 13 years of age who suffered from the most severe type of scarlet fever, complicated at various times by hematuria, epistaxis, and hemoptysis. The first symptoms of gangrene appeared on the sixth day of the fever. These symptoms were engorged veins and pain in the leg, and on the eighth day a subcutaneous hemorrhage took place. The right leg was the one involved. The conditions contributing to the establishment of gangrene are the changes in the blood, weakened heart-action, and the mechanical difficulties of circulation.

Two cases of **emphysematous gangrene caused by *Bacillus aerogenes capsulatus*** are reported by Loeb.³ The first patient was a man 43 years of age. The gangrene began in the left arm and extended before death over the entire extremity, the face, scalp, and chest. The bacillus was not found in smears or cultures of the heart-blood, but was found after

¹ Ann. of Surg., June, 1901.

² Lancet, Oct. 5, 1901.

³ Amer. Med., July 27, 1901.

inoculation into rabbits, which were killed in 24 hours and presented the characteristic lesions. In this case there was no history of traumatism. The second case occurred in a boy 9 years of age who had received an abrasion of the leg. A few hours after the injury the patient became delirious and developed a high temperature. Gangrene developed so rapidly and was so diffuse that amputation was advised but was not permitted. Numerous extensive incisions were made and the boy recovered, with a backward subluxation of the knee.

Howell,¹ of the British army, reports from India a case of **cobra bite treated successfully with Calmette's antivenene**. Before the employment of the antivenene the finger which was bitten had been tightly ligated, the wound scarified, and a strong solution of calcium chlorid applied. Seven cubic centimeters of Calmette's serum were injected in 2 doses. Prior to the injection the patient was suffering from no symptoms. The only symptoms noted after the injection were an increased frequency of respiration, variations in tension of the pulse, drowsiness, slight lividity of the face and lips, and weakness of the legs. These symptoms go to corroborate the theory that cobra venom is a nerve poison. Howell believes that the injection of the serum saved this patient's life, and recommends its immediate employment in all cases of snake-bite without waiting to discover whether or not the snake was a poisonous one.

Kemp² reports a case of **snake-bite in a Kaffir boy treated successfully with large doses of strychnin**. The snake was a puff adder. The patient arrived at the hospital 6 hours after the receipt of the bite and after a walk of 4 miles. At this time the arm had begun to swell, but little pain was complained of; later the boy became very drowsy and the swelling increased until it spread over the whole upper extremity and the chest. The pulse became very rapid and frequent, and the respirations also were greatly increased. The patient complained of feeling hot, although the extremities to the touch felt cold. During convalescence there was an evening rise of temperature. Strychnin in large doses, with other stimulants, comprised the treatment. Calmette's antivenene was not employed, as its antidotal action takes place only when it is employed within 4 hours after the receipt of the bite.

CYSTS AND TUMORS.

The **treatment of malignant disease** is discussed by Frederic S. Dennis,³ who also presents various statistics to show the great increase of cancer during recent years. In comparing the mortality rate of cancer of the breast in Philadelphia for the five years from 1861 to 1865 with that of the five years between 1896 and 1900, it is shown that there has been an increase of 179 %. If, however, the period from 1876 to 1880 is compared to that of from 1896 to 1900, an increase of only 12 % is shown. This difference is attributed by Dennis to the operative treatment of cancer during late years in the city of Philadelphia. There were 18,000 deaths from

¹ Brit. Med. Jour., Jan. 25, 1902.

² Brit. Med. Jour., Jan. 25, 1902.

³ Jour. Am. Med. Assoc., Oct. 19, 1901.

carcinoma in the United States in 1890. In speaking of the treatment of malignant disease the value of the Röntgen rays must still be considered *sub judice*. Much time must elapse before this means of treatment becomes a recognized therapeutic agent for carcinoma, although certain cases of epithelioma have received much benefit. [For the x-ray treatment of cancer see section on x-rays.] Dennis condemns electricity as "worse than useless." The application of caustics is much more painful than the more radical removal with the knife, and although caustics are useful in some forms of myxoma they have won no stable place in the treatment of cancer. With the use of nitrous oxid gas Dennis has been able to operate upon many cases in which the use of ether was contraindicated, and in which formerly caustics might have been recommended. Many drugs, such as formalin, pyoktanin, Chian turpentine, methylene-blue, potassium iodid, and thyroid extract, have at various times been lauded as curative remedies, but none of them has done more than alleviate and improve certain cases; no absolute cures can be attributed to any drug. The author has found thyroid extract to be more beneficial than any of the others. Considerable space is devoted to the discussion of Coley's toxin treatment, the author believing that the only cases in which this treatment is apt to prove of much value are those in which after one or two operations it is used as a prophylactic. It is believed that the knife offers the only absolute cure for cancer. Dennis devotes the latter portion of his paper to a discussion of the results which he has obtained by early and thorough operation. No case is given as a cure which has not passed the 3 years' limit. In each case the diagnosis of malignancy has been confirmed by the microscope. He presents 87 cases of malignant tumors in which operative treatment has resulted in recovery without recurrence after periods ranging from 3 to 22 years; 48 of these were cases of sarcoma, and 39 of carcinoma.

The present status of the carcinoma question is considered at considerable length by the elder Senn.¹ The author's views may be expressed in the following 27 propositions:

"1. The most notable contributions to the present status of the carcinoma question are to be found in the investigations which have thrown new light on the origin, growth, segmentation, and manner of local and general dissemination of the carcinoma cell.

"2. Carcinoma is a tumor resulting from an atypical proliferation of epithelial cells from a matrix of embryonic cells of congenital or postnatal origin.

"3. The law of the legitimate succession of cells holds true in the origin and growth of tumors, both benign and malignant, as well as in the production of normal and inflammatory tissue.

"4. As carcinoma always originates from epithelial cells, primary carcinoma in mesoblastic tissue is impossible from a histogenic standpoint, unless a matrix of embryonic epithelial cells has become displaced during the development of the embryo, or embryonic epithelial cells have become buried in mesoblastic tissues after birth, by injury or disease.

¹ Jour. Am. Med. Assoc., Sept. 28, 1901.

" 5. The histology and histogenesis of carcinoma speak against the parasitic origin of this disease.

" 6. The stroma of carcinoma consists of pre-existing connective-tissue fibers and their descendants.

" 7. Carcinoma cells usually multiply by irregular, atypical karyokinesis, and this pathologic segmentation is an important indication of malignancy, and as such is of considerable diagnostic value.

" 8. The progressive extension of a tumor to adjacent tissues and organs, regardless of their anatomic structure, is a strong proof of its carcinomatous character.

" 9. Regional metastasis in carcinoma takes place exclusively through the lymphatic channels, and the pre-existing lymphatic structures take no active part in the origin and growth of the secondary tumors.

" 10. General dissemination of carcinoma usually takes place by direct implication of veins in the primary or secondary tumors. Carcinoma cells reach the venous circulation through the formation of an intravenous tumor thrombus, through carcinomatous endophlebitis, or, finally, through perforation of the vein-wall by isolated carcinoma cells. Retrograde intravenous extension of carcinoma is due to the transportation against the venous current of minute emboli of carcinoma cells surrounded by a mantle of corpuscles of blood which move, step by step, upon the intima. Retrograde extension through the lymphatics may take place in the same manner, but there is very little doubt that it is more frequently the result of carcinomatous endolymphangitis.

" 11. The increase of carcinoma seemingly shown by some recent statistics is more apparent than real.

" 12. Heredity is a generally recognized potent predisposing cause of carcinoma.

" 13. As a rule, carcinoma occurs in persons of advanced age, but occasionally is met with in persons less than twenty-five years of age, and in the latter case the disease is characterized clinically by its great malignancy.

" 14. Carcinoma seldom follows a single injury, but develops more frequently in consequence of repeated injuries or prolonged continuous irritation.

" 15. Among the predisposing causes of carcinoma must be enumerated racial, climatic, and topographic influences.

" 16. Chronic inflammatory products, cicatrices, and benign epithelial tumors produce local conditions favorable to the development of carcinoma.

" 17. The positive results of implantation and inoculation experiments have so far failed in establishing beyond all doubt, upon a bacteriologic and histologic basis, the parasitic theory of carcinoma.

" 18. A careful study of the experimental researches and bacteriologic and histologic investigations concerning the etiology of carcinoma does not at the present time warrant the claim for this disease of a parasitic origin.

" 19. The experience of centuries and the internal use of innumerable

remedies have demonstrated that so far carcinoma has not been materially influenced for the better by this method of treatment.

"20. Direct medication of carcinomatous tissue by parenchymatous injections has no influence in retarding or arresting its growth, while the injection of sclerogenic substances into the connective tissue around the border of the tumor appears to restrain the local extension of the disease by impairing the blood-supply to the parenchyma of the tumor.

"21. Local applications of any kind in the treatment of ulcerating carcinoma must be considered at best only in the light of palliative measures.

"22. The actual cautery and chemical caustics have only a limited field of usefulness in the treatment of open inoperable carcinoma. They should never be employed in the treatment of closed carcinoma as a substitute for the knife.

"23. The treatment of carcinoma by different sera has, without any exceptions, yielded only negative results.

"24. The early and radical operative treatment of carcinoma offers the only prospect for permanently eliminating the disease.

"25. The permanency of the results of the operative treatment of carcinoma cannot be determined in less than 10 years after the operation.

"26. A radical operation for carcinoma should never be attempted unless the local conditions and general health of the patient are such as to promise an equivalent of the immediate and remote risks to life and comfort involved in the operation.

"27. Taking it for granted that carcinoma is the product of an erratic, planless cell-growth outside of the range of the physiologic influences which preside over and regulate normal growth and tissue repair, it appears logical in the search for curative agencies to make experiments and observations with the view of finding a remedy which would destroy the tumor by causing an early and speedy degeneration of its parenchyma, or which would possess the property of converting embryonic into mature epithelial cells, thus converting a carcinoma into a benign epithelioma."

"Optimism vs. pessimism in the surgical treatment of cancer" is discussed by Robert Abbe.¹ The author states that it is a mistake to allow ourselves to be influenced in our treatment of cancer by the not infrequent unsatisfactory results obtained from operation. On the contrary, surgeons should look upon the good results which are frequently had from early and thorough operation. It should be borne in mind that in the beginning cancer is a local disease, and that it can be removed by the knife in such a manner that it will never reappear. "It may be left long enough where it first starts to beget infarction, and start anew in unnumbered points throughout the body, but not so at first. Unmistakable evidence proves that when the disease reappears after operation the so-called 'recurrence' is not a return of the disease, but a continued growth of left-over particles. This fundamental fact in the study of the subject should be so indelibly impressed on the mind of the operator that it is present every moment of operation, so that he shall give the widest possible berth to the apparent growth. The truth of this fact is shown by the localiza-

¹ Med. Rec., Dec. 14, 1901.

tion of the recurring nodules, either in the immediate precincts of the scar, or in the nearest lymphatics." The lesson to be drawn from the surgical experience of recent years is that in operating the surgeon must make up his mind to cut wide of the diseased area without regard to the subsequent deformity. The attempt to close wounds with a minimum amount of deformity is a too frequent mistake of the inexperienced surgeon. Halsted, by his thorough method, has done a great deal to show the advantage of extensive removal of the disease, and also the satisfactory repair which is obtained by the use of large Thiersch grafts. Abbe refers to a number of patients suffering from malignant disease in various parts of the body in whom he has obtained satisfactory results; these include cases of both carcinoma and sarcoma.

C. B. Keetley¹ in writing on the **prophylaxis of carcinoma** states that he believes carcinoma is caused by a living organism which thrives in either the secretions or cells of the skin glands. He advises that all milk, butter, and cheese should be sterilized. The commonest seats of primary carcinoma are in the alimentary canal, where food may lodge or adhere. The author says that primary cancerous infection in places which are not accessible to milk and its products may be due to conveyed infection via the lymphatics. Secondary carcinoma implies that not only the cancer germ, but the epithelium in which it lives, have been conveyed from one part of the body to another. He speaks of the importance of removing chronic inflammations, suppurations, and ulcerations and of avoiding well-known sources of irritation of skin or mucous membrane. Keetley says nothing but smooth, clean linen, cotton or silk, and soap and water should come in contact with the nipples. They must not be touched with the hand or fingers.

Jos. D. Bryant² refers to the early belief that **mental depression influences the development of malignant disease**, and shows by quotations from eminent authorities that this belief has been shared by some surgeons throughout all time. Bryant discusses the matter very carefully and presents tables from the male and female departments of the Manhattan State Hospital for the Insane showing the relative frequency of cancer. The preponderance of scientific opinion favors the idea that mental depression at the most exercises only a predisposing influence in the causation of the cancer; also that this influence is a natural product of a defective nutrition incident to the perturbation itself.

The question of the **curability of cancer** is discussed by Adamkiewicz,³ who reports remarkable improvement in a case of extensive carcinoma of the uterus and vagina, the result of treatment by "canceroin." The author believes that cancer is due to a protozoon, and that the preparation known as "canceroin" is capable of causing necrosis and softening of the fresh and growing cancer-cells which ultimately become absorbed; the older cancer-cells are destroyed by the injections, but are not absorbed.

Adamkiewicz⁴ reports 4 cases of **carcinoma of the esophagus**

¹ *Lancet*, Aug. 31, 1901.

² *Berl. klin. Woch.*, June 10, 1901.

³ *Amer. Med.*, Nov. 2, 1901.

⁴ *La Presse méd.*, July 22, 1902.

which were cured by "canceroin." In each of these cases it is stated that there is no doubt about the diagnosis, and in each the remedy proved most remarkably successful. [The cases reported by Adamkiewicz lack certain important details as regards diagnosis and the subsequent history of the patients. Certainly sufficient time has not elapsed in any of his cases to warrant their being reported as cured.]

The **treatment of inoperable cancer** is made the subject of an address by Alfred Cooper.¹ He urges further investigation in this field and reaches the following conclusions: (1) That in cases of inoperable sarcoma, more especially the spindle-cell variety, the patient should have the option of Coley's fluid given him, since a certain number of cases have been cured. (2) That in cases of inoperable cancer of the breast in women of about 40 years of age in whom the menopause has not occurred the operation of oophorectomy should be proposed, and this treatment may be combined with thyroid feeding. (3) That in cases of inoperable rodent ulcer and in superficial malignant ulceration in other parts the Röntgen rays give a good hope of improvement. (4) That in cases where these other methods are declined or are inapplicable the internal administration of celandine is worthy of trial, and when the case appears quite hopeless morphin should be pushed without hesitation. (5) Finally, he would suggest that before trying any of these remedies the risk should be fully pointed out to the patient, that the faint hope that most of them afford should not be magnified, and that the discomfort of treatment should be fully discussed; in fact, the surgeon should not do more than offer the treatment and leave the person to accept or refuse it.

Beatson,² in dealing with the **treatment of cancer of the breast by oophorectomy and thyroid extract**, reports a striking case of a woman 44 years of age whom he saw about a year previously. At that time the patient had a large inoperable carcinoma of the right breast with extensive glandular enlargement in the right axilla and above the clavicle. The left breast contained a suspicious mass and a large gland was present also in the left axilla. A careful physical examination revealed no malignant growth in any of the other viscera. Both ovaries were removed and found to be cystic. At the time of the operation a small portion of the breast tumor was taken for microscopic examination and report showed it to be a carcinoma. About 10 days after the operation the patient was put upon 5 grains daily of the thyroid extract, which was increased to 15 grains. Six months after the operation Beatson found that the previously large and tense mamma, which was covered with dusky skin and appeared on the verge of ulceration, had practically disappeared, and in its place was found a small, dense, flattened, cicatricial mass which lay on the thoracic wall with the nipple in its center. Close around it were a few pea-like hard nodules, but the adjacent skin was free from disease. No enlarged glands could now be felt in the left axilla and the suspicious mass which had been found in the left breast could scarcely be detected. Beatson also presents a photograph of a patient who has been under his observation for 6 years and who seemed, until recently, on the road to a natural

¹ *Lancet*, Oct. 12, 1901.

² *Brit. Med. Jour.*, Oct. 19, 1901.

cure. Lately, however, there has been a fresh manifestation of the disease, which he attributes to the injudicious application of some remedy recommended to the patient. In this case the patient presents the appearance of having had the breast removed by the knife, but this is not the case, no operation having ever been attempted. The woman is 64 years of age. The menopause occurred at 44 and the growth appeared at 48. During 16 years the growth has shown various phases of activity not easy of explanation. In regard to the use of the thyroid extract, Beatson has used it in doses as high as 250 grains daily, but did not observe any special benefit from such large quantities, and usually prefers to give only 15 grains daily. The author lays down the rule that oophorectomy is not advisable in cases where secondary organic deposits are present or suspected. He has confined the employment of oophorectomy and the thyroid extract to cases of inoperable cancer. [McNicol¹ gives the final report regarding the above case of mammary cancer treated by oophorectomy and thyroid extract reported by Beatson. He states that 6 months after the operation evidences of recurrence of the disease at its former site and of metastases began to develop, and that the patient, after great suffering, died 11 months after the operation. He expresses the belief that in this case the operation did not prolong life.]

Herman² reports his experience with **oophorectomy for carcinoma of the breast**, which includes 8 cases. The first case was operated upon on March 2, 1897, for recurrent carcinoma of the breast. The patient was alive and well, and free from cancer, in July, 1901. In the second case there was a prolongation of life, the patient having 18 months of good health. The same prolongation was obtained in the third case. In the fourth case there was a prolongation of life of about a year of good health. The fifth case was operated upon in June, 1899, and in July, 1901, the improvement which followed immediately after the operation had been maintained and there was no evidence of disease elsewhere. In the sixth case there was no benefit from the operation, and in the seventh case the progress of the disease was arrested for a few months. In the eighth case considerable improvement took place, but the patient died 9 months after the operation from obstruction of the bowels.

Robert Abbe³ reports 2 cases of **inoperable recurrent cancer of the breast in which oophorectomy resulted in marked improvement**, and refers briefly to 5 other cases in which he has recently employed this method of treatment. The first patient was a woman 42 years of age who suffered from extensive recurrence after a complete operation. Oophorectomy was performed, and in one week changes in the cancerous nodules were noticed. Four months after the operation there was no trace of a malignant remnant anywhere. Another case reported by Abbe is that of a woman 70 years of age whose breast he had removed two years previously for cancer. The ovaries in this case were atrophied and apparently normal. Little result was expected from the operation, but 3½ months later the patient was in perfect health, the ulcer having entirely healed.

¹ Brit. Med. Jour., Nov. 9, 1901.

² Brit. Med. Jour., Oct. 19, 1901.

³ N. Y. Med. Jour., Aug. 3, 1901.

The five more recent cases operated upon by Abbe have not shown the immediate improvement exhibited by these two, but they are as yet too recent to report definitely.

Edmunds¹ reports the case of a woman 36 years of age in whom he obtained a favorable result from **oophorectomy and thyroid feeding**. Recurrences in this case had taken place in the opposite breast as well as in the scar. One year after the operation the patient had gained flesh and was free from all symptoms. In this case there was also a small growth behind the ear which disappeared after the operation.

Oophorectomy in the treatment of cancer of the breast is dealt with in a clinical lecture by Butlin.² Although admitting that he has not himself employed this treatment, Butlin does not appear to look with favor upon it. He states that there has been no single case in which an absolute cure can be claimed.

E. Percy Paton³ reports 2 cases in which he has performed **oophorectomy for inoperable scirrhus of the breast**. One of the patients was 43 years of age and the other 31. In both cases the recurrent growth was very extensive. In neither case was the treatment productive of any benefit to the patient.

A brief and interesting history of the **operations practised for the cure of mammary cancer** is presented by Sir Wm. Banks.⁴

A. Marmaduke Sheild⁵ presents the **results of operations in 60 cases of malignant disease of the breast**. Of these patients 40 were operated upon sufficiently long ago to be placed in a statistical table. The first part of the paper consists in a review of the treatment of the condition and its diagnosis. Stress is laid upon the fact that in the majority of cases cancer of the breast in its commencement is insidious, quiet, and often quite painless. The slightest "hardness" or "thickening" in the breast of a patient past 40 years should be looked upon with the greatest suspicion. The author places more confidence in the macroscopic appearance of the tumor than in the microscopic appearance. Involved glands which cannot be felt through the skin, or perhaps when the axilla is opened, are frequently found after division or removal of the pectoral muscles. The author's experience and observation of the experience of others with double ovariectomy for recurrent cancer of the breast has not been such as to cause him to put any confidence in this treatment. As recurrences have frequently taken place 5 years after operation, immunity for 3 years after operation is not considered indicative of a cure. Sheild, in discussing the method of operating, says that he always employs as an anesthetic gas and ether, followed by chloroform in the later stages of the operation. He strongly advocates drainage of the wound. He refers to the error of mistaking a soft carcinoma of rapid growth for an abscess. Before operation for malignant disease a careful examination of the viscera should be made to discover whether or not dissemination has taken place. Since the modern thorough operation has been employed local recurrence is very

¹ Lancet, Mar. 29, 1902.

³ Brit. Med. Jour., Mar. 1, 1902.

² Brit. Med. Jour., Jan. 4, 1902.

⁴ Brit. Med. Jour., Jan. 4, 1902.

⁵ Lancet, Mar. 8, 1902.

rare, and, when it does occur, can be easily removed. Edema of the arm, formerly so frequently encountered, is now seldom seen, as the glands which produce the pressure are removed. Of the 40 tabulated cases, 8 were well five years after operation; 4, four years; 7, three years; and 11, two years. Some of the cases of local recurrence have been operated upon a second time and are now free from any trouble. Stress is laid upon the importance of not keeping the arm bound down for any length of time after the operation; Sheild always begins the gradual elevation of the arm at the end of the first week in order to prevent axillary adhesions.

Warfield¹ has collected from literature 32 cases of **carcinoma of the male breast**, to which he adds 5 others, 4 of which occurred in the Johns Hopkins Hospital. The disease was found to be most frequent between the ages of 40 and 70, the youngest patient being 12 years of age and the oldest 91 years. The disease was no more frequent in one breast than in the other. In 8 of the 37 cases there was a definite history of injury. Imbert states that when the disease is met with in males, the breast is oftentimes abnormally developed. Pain was an infrequent symptom, being noted in only 9 cases. Ulceration was present in 13 cases. In nearly every case where the tumor had remained latent for a long time some irritation caused its rapid enlargement, with, at times, ulceration. Retraction of the nipple was noticed in 12 cases and discharge from the nipple in but one. In 20 cases the axillary glands were enlarged, and palpable. In every case the growth was described as being hard. Microscopically no peculiarities of structure in the male cancers have been found. Thirty-four cases were operated upon, 2 of the remaining refused operation, and 1 was inoperable. In Blodgett's case of a boy 12 years of age the patient was well 5 years after the removal of the growth. One of the cases reported by Warfield, that of a man 47 years of age, was operated upon at the Johns Hopkins Hospital. Soon after the operation the patient began to complain of pain in the back, and gradually developed all the symptoms of cancer of the spine with pressure upon the cord. At the autopsy portions of the sternum, the ribs, and the vertebræ were found to be the seats of metastatic deposits. At one point the cord was found definitely softened and narrowed to about one-half its normal thickness from pressure. The author concludes that there is little difference between carcinoma in the male and in the female breast, except that in women the atrophic scirrhous carcinoma is much more common than in men.

Roswell Park² discusses the **nature of the cancerous process** and expresses the conviction that cancer is undoubtedly due to an animal organism. He states that Gaylord, in the Buffalo Laboratory, has absolutely produced adenocarcinoma in a number of animals, and that in this way the infectivity of the disease has been unquestionably established. The time has not yet arrived when a minute description of the cancer organism can be given. It is thought, however, that these organisms belong to the protozoa. The work done in the Buffalo Laboratory corresponds in nearly all its results with the work done by Max Schüler. The

¹ Bull. Johns Hopkins Hosp., Oct., 1901.
² Jour. Am. Med. Assoc., Sept. 14, 1901.

hope is expressed that when the parasitic cause of the disease is more thoroughly understood some method of counteracting or destroying it may be discovered.

Herbert C. Major¹ in an address on **some considerations in relation to the investigation of cancer**, discusses the various theories regarding the origin of the disease, and concludes that sufficient evidence has not been as yet presented to warrant the absolute acceptance of any of them. In advising a quiet and thorough investigation of the subject he quotes Johnson, who says: "To be ignorant is painful, but it is dangerous to quiet our uneasiness by the delusive opiate of hasty persuasion."

A. Laurie Watson² reports a case of **recurrent sarcoma with apparently spontaneous cure and gradual shrinking of the tumor**. The patient was a woman 36 years of age who was admitted to the hospital because of a large and pendulous tumor attached to the left side of the back. The growth presented the appearance of a lipoma undergoing degeneration. The growth was removed and several independent microscopic examinations showed it to be a mixed round- and spindle-cell sarcoma. A week after the operation the wound began to ulcerate and the tumor rapidly reappeared, quickly reaching its former size. The growth was so extensive that its thorough removal was considered impossible. After a time, however, the tumor began to lessen and gradually shrank, and the wound entirely cicatrized. One year after the operation the patient was in excellent health; the tumor was much less prominent and hung as a loose sack of skin. Manipulation and the pressure of clothing produced no pain whatever. Except for the ulceration no inflammatory phenomena presented themselves locally after the operation, though the patient had considerable fever for 10 days. [The fact that ulceration occurred and was accompanied by fever would seem to us to offer an explanation, and the only explanation, of the disappearance of the sarcoma in this case. Wyeth has pointed out the value of infection in curing sarcomata.]

The question of **disappearing tumors** is discussed by Warthin and Spitzley.³ Under this heading are not included the so-called "phantom" or "apparent" tumors, but only those conditions in which actual new-growths of tissue have temporarily or permanently disappeared. After reviewing the literature of the subject and referring to many reported cases, the authors reach the following conclusions: "First, that in spite of skilful clinical observation, the ultimate behavior of a tumor is seldom to be determined except by microscopic examination, and that many seeming malignant neoplasms are taken to be such when really they are but the outcome of an inflammatory condition. Second, that probably no true neoplasm, malignant in nature, ever disappeared except through retrograde changes induced in itself through infection of the tumor tissue, or through affections or infections of other parts of the body having, by reason of toxins, practically the same effect. To this there are extremely rare exceptions in which the disappearance of the growth takes place by

¹ Brit. Med. Jour., July 20, 1901.

² Lancet, Feb. 1, 1902.

³ Med. News, Sept. 21, 1901.

an excess of retrograde processes over those of growth. Third, that we must look to the inflammatory process, acute or chronic, for the explanation of the appearance and disappearance of these masses of tissue which before and even during exploration appear to be actual new-growths."

Sir William H. Bennett,¹ in a clinical lecture, deals with the **causes and significance of phantom tumors** in a most instructive manner. Tumors of this kind may be divided into irritation phantoms, being a muscular contraction produced by irritation of the skin or the existence of some underlying disease; occupation phantoms, being a contraction of muscle the result of continued use; imitation phantoms, which occur in neurotic people possessing a tendency to imitate. An interesting case of irritation phantom is reported. The patient was a girl 16 years of age who presented an abdominal swelling closely resembling that produced by a gravid uterus. This tumor was present during sleep. It was, however, resonant, and rectal examination revealed nothing in the pelvis. The patient was anesthetized and the tumor gradually disappeared. The cause of this phantom tumor was eczema about the umbilicus. When this was relieved by treatment, the tumor disappeared, only to reappear when from neglect the eczema returned. Another case is referred to in which there was a disappearing tumor upon the inner side of the thigh, presenting evidences of fluid deeply seated. Exploratory puncture, however, revealed no fluid. The patient was prepared for operation, but when the part was exposed no tumor was present. On recovery from the anesthesia, however, the tumor reappeared. There was present in this case an inflamed sebaceous cyst at the vulvo-femoral fold. When this was removed, the tumor entirely disappeared. Another case is referred to in which there was a marked contraction of the abdominal wall over the appendix region, producing the impression given by an appendix abscess. Certain symptoms, however, pointed to the gall-bladder, and when the patient was anesthetized the tumor in the appendix region had entirely disappeared, and when the abdomen was opened a gall-stone was found in the cystic duct. In another patient a similar muscular contraction produced an apparent tumor in the right iliac region when the cause of the trouble was an acute suppurative ovaritis. Bennett describes this tumor as a "protective" phantom. An interesting case of occupation phantom is referred to. The patient was a man 35 years of age whose occupation required him frequently to hold his arm elevated at right angles to the body for a considerable time. This produced a contraction of the cervical muscles which was so hard as to resemble closely an exostosis or cervical rib. A skiagraph, however, showed no evidences of either bone or new-growth. Under ether the tumor entirely disappeared. In discussing the diagnosis of phantom tumors, Bennett remarks that it must be remembered that in abdominal "phantoms" a tumor may be partly real and partly phantom; this is frequently seen in appendicitis, where the pain on palpation produces a contraction of the abdominal wall. Whenever a tumor of doubtful origin is accidentally met, and the tumor is hard and elastic and of a form such as may arise from the contraction of

¹ Lancet, Jan. 4, 1902.

a muscle or set of muscles, the possibility of its being a phantom must be thought of. This is especially true of abdominal tumors which are resonant or nearly so. In the majority of cases it is impossible to make the diagnosis without the aid of an anesthetic. Occasionally examination during sleep will reveal the nature of the tumor, but this is rare, as many phantoms persist during sleep. During the anesthetization of such a patient the hand should be kept over the growth and any change in it carefully noted. An examination after anesthesia is complete is not sufficient. A phantom tumor never suddenly disappears, but does so gradually, therefore the examination with the hand during the etherization enables the surgeon to differentiate between a tumor which ruptures or which slips into a remote part of the abdomen, and one which is a phantom. In the examination of the abdomen the hand should always be warm and be applied flat upon the surface. Examination of the abdomen with the finger-tips or with cold hands is certain to produce muscular contraction and greatly interfere with the proper examination of the abdominal wall or the underlying structures.

The question of **abdominal echinococcus cyst** is presented by Frank Hartley,¹ who reports 4 cases, 3 of which involved the liver and 1 of which was situated in the rectovesical culdesac. Of all cases of abdominal echinococcus cysts, 47 % occur in the liver, and nearly 70 % of these occupy the lower surface of the organ and grow toward the peritoneal cavity. Because of the pressure symptoms produced by the growth the differential diagnosis between this condition and cholelithiasis and chronic suppurative cholecystitis is often difficult. The first case reported by Hartley is that of a man 25 years of age in whom very few pressure symptoms were noted. The tumor in this case was found to be situated in the posterior half of the inferior surface of the right lobe of the liver; it was so firmly fixed and was so immovable that it could not be made to approach the abdominal wall by several centimeters, therefore the wound was packed from the abdominal wall to the level of the tumor in such a manner as to expose a portion of its wall. Five days later the cyst was opened and drained, the patient making a good recovery. The second patient was a man 32 years of age. In this case there was marked enlargement of the liver, and an aspirating needle introduced through the eighth intercostal space resulted in the withdrawal of fluid which contained hooklets. Four inches of the seventh, eighth, and ninth ribs were resected and the diaphragmatic and costal pleuræ were incised and sutured so as to close off the pleural cavity. The cyst was then incised, and numerous cysts varying in size from a marble to an egg were evacuated. The fluid escaping from the cyst was seropurulent and mixed with blood and bile. Gauze drainage was employed and the patient made a satisfactory recovery. In the third case, that of a man 28 years of age, the cyst, which occupied the upper surface and anterior border of the liver, was enucleated. The resulting hemorrhage was easily controlled with the cautery and pressure. The raw area of liver tissue was approximated by means of 2 catgut sutures. The abdominal wound was closed and healed primarily. This

¹ Med. Rec., April 26, 1902.

patient also made a good recovery. Regarding the use of the exploring needle, Hartley says that its introduction through the peritoneal cavity is to be avoided, but that in cysts occupying the superior surface and posterior border of the liver the needle may be employed. The fourth case is that of an echinococcus cyst situated between the bladder and the rectum. Nearly the entire cyst-wall in this case was removed and the small remaining portion was finally obliterated by nature. Because of the escape of the cystcontents into the abdominal cavity it became necessary to withdraw the intestine and thoroughly irrigate the entire cavity. During this manipulation no evidence of any other cysts was found. In making this statement Hartley refers to the great rarity of solitary echinococcus cysts of the peritoneum.

Lambert¹ reports 2 instructive cases of **hydatid cyst**. The first case is that of a boy 14 years of age who suffered from an attack of typhoid fever complicated by a hydatid cyst of the pelvis, which produced symptoms closely resembling those of acute appendicitis. These symptoms developed on the ninth day of his illness; on the evening of this day Stirling operated upon the patient and found the appendix normal. A smooth rounded tumor extended from the lower part of the iliac fossa down into the pelvis behind the bladder. The cyst was tapped and found to contain clear fluid. The edges of the cyst were sutured to the abdominal wall. The cyst contained a number of daughter-cysts, which were removed. Seven weeks after the operation the patient was perfectly well except for a small sinus. The second case is that of a man 40 years of age who presented a hydatid of the convex surface of the liver. The patient was struck in the right side by a tree which he was felling. Following the injury he was shocked, and presented the symptoms of severe hemorrhage. Stirling made a vertical incision through the right rectus muscle directly over a prominent tumor below the costal border. When the abdomen was opened, this tumor was found to be the liver itself, which had been pushed forward. The abdominal wound was closed and exploration with the needle was practised from behind. In the eighth axillary space clear fluid was obtained. The abdominal wound was closed and 1½ inches of the eighth rib removed, the cyst being then opened through the diaphragm in the usual manner. When the cyst was opened in this position, a large amount of blood-stained fluid and darkly stained daughter-cysts escaped. Irrigation of the cyst showed that bleeding into the sac was still taking place. To control this, the sac was packed with iodoform gauze. The patient died from continued bleeding on the sixteenth day. At the postmortem the sac was found almost full of blood-clot. The bleeding was found to have originated from one of the large hepatic trunks which communicated with the cyst.

Martin² reports a case which goes to prove that the **peritoneum** may become the **seat of secondary hydatid tumor** the result of rupture or leakage of a primary cyst. The patient was a man 37 years of age who for 10 years presented distinct symptoms of hydatid disease of the liver. Upon

¹ Intercol. Med. Jour. of Australasia, Nov. 20, 1901.

² Bull. et Mém. de la Soc. de Chir. de Paris, No. 2, 1902.

violent muscular effort the patient felt something give way in the upper part of his abdomen. After a brief period he developed pain in the back and epigastrium, accompanied by nausea, occasional vomiting, and rapid emaciation. He was operated upon and the ruptured cyst found on the under surface of the liver covered only by peritoneum and adherent viscera. An examination of the peritoneum both of the abdomen and pelvis showed it to be covered with small hydatid cysts varying in size from a small nut to that of a hen's egg.

Lyon¹ presents a review of **echinococcus disease in North America**. It is shown that 40 % of the American cases occur in Icelanders, and that foreigners represent 91 % of all cases. The liver was the seat of the condition in 75.7 % of the cases. It is impossible from the data furnished to say definitely that the disease is increasing. Stiles, however, states that in domesticated animals the disease in the United States is undoubtedly increasing. The disease in man and animals is one and the same, derived from the ingestion of the eggs of *Tænia echinococcus*, which inhabits the intestinal tracts of dogs and wolves. In only one instance, however, has it been definitely shown that this tapeworm was found in a dog in the United States. The prophylaxis of the condition lies in the enforcing of proper sanitary regulations at the slaughter-houses, particularly in the country slaughter-houses.

Le Conte² discusses **hydatid disease of the breast**, and presents an interesting case illustrating his remarks. The patient was a young mulatto. The tumor, which was on the right side, appeared 2 years after a miscarriage and 5 years after a chronic cervical adenitis on the same side. Little change took place in the growth until it was subjected to injury, when it increased rapidly. The tumor fluctuated, was globular, slightly tender, and about the size of a small cocoanut; the skin over the tumor was normal and was not adherent except for a small area surrounding the nipple, where it was not only adherent but slightly inflamed. A small mass of tender and enlarged glands was found in the right axilla. A suppurating sinus which looked tuberculous was present on the right side of the neck. In discussing the question of diagnosis in this case Le Conte considered three conditions—an adenoma undergoing cystic degeneration, tuberculous abscess, and echinococcus cyst. The last condition was put aside because of its great rarity and because of the duration of the growth, which was more than 4 years. During the operation which he performed the cyst was ruptured and from 12 to 15 ounces of pus escaped, which when immediately examined was found to contain hydatid hooklets in large numbers. As very little of the gland tissue was free from involvement the whole breast was removed, together with the enlarged axillary glands. The wound healed primarily and the patient made a satisfactory recovery. It is thought by Le Conte that the earlier writers too frequently made a diagnosis of hydatid diseases of the breast, classifying the majority of cysts occurring in the breast under this head. He has examined the literature of the subject very carefully, and presents a table of 33 cases in which a definite diagnosis of hydatid disease of the

¹ Am. Jour. Med. Sci., Jan., 1902.

² Am. Jour. Med. Sci., Sept., 1901.

breast is warrantable, but, so far as he knows, he believes his own to be the first case reported in America. He quotes numerous statistics of this condition which go to show the great rarity of hydatid disease in the breast. No case in which the male breast has been affected has yet been reported. The condition is found to be most frequent during the child-bearing period, the oldest patient in Le Conte's list being 46. The right breast seems to be involved more frequently than the left, and the upper portion of the organ more frequently than the lower. In all of the cases reported the growth began as a small, hard, movable tumor, usually free from pain, while in about one-half of the cases the tumor gradually and slowly increased in size, and in the others there were periods in which no increase occurred. Traumatism seems to have produced rapid increase in many cases. In only one case were multiple cysts found. Pain appeared late in the disease or accompanied a rapid increase in the size of the growth; enlargement of the axillary glands was present in 6 cases; fluctuation was by no means a constant symptom, while the crepitation which is characteristic of hydatid disease in other organs was noticed in none of the cases in this table. Urticaria, the so-called hydatid rash, which has been noticed after aspiration of an echinococcus cyst of the liver, was noticed in none of these cases in which aspiration or puncture was practised. Degeneration of the cyst as it increases in size is very common, suppuration being frequent, often resulting in the formation of adhesions and occasionally in ulceration and the establishment of sinuses. The passage of daughter-cysts through these sinuses has occasionally led to diagnosis. Attention is called to the fact that death of the hydatid may occur from other causes than suppuration. The cyst-contents sometimes become of a putty consistency, containing "fat, granular debris, carbonate and phosphate of lime, cholesterin, hooklets, and broken-down hydatid scolices." Death of the hydatid may result from the natural termination of the existence of the parasite, from the production of daughter-cysts which are so numerous as to destroy the mother-cysts by pressure, and may also occur because the growth of the hydatid is much more rapid than that of the surrounding fibrous sac, resulting in a cutting-off of the food-supply of the parasite. It is also possible that the disease may terminate with advancing age from increasing denseness of the fibrous capsule which produces an interference with the circulation within the cyst. The growth has occasionally been described as irregular and lobulated, and Le Conte thinks that this condition results from degenerative processes which take place in the fibrous capsule. The author refers to the interesting fact that fluctuation is absent in this condition except when the tumor has reached a large size. The following treatment is suggested: (a) When the cyst is young and not adherent to the surrounding tissue, it should be removed; (b) when it is old and large and intimately connected with breast tissue, so that excision would involve considerable mutilation of the gland itself, the growth should be freely incised, the contents evacuated, and the cavity packed and allowed to heal by granulation; (c) when the cyst is quite large, thick-walled, and firmly adherent, but surrounded by a considerable portion of breast

tissue, a partial amputation of the mamma is indicated; (d) if the cyst is so large that most of the breast tissue has disappeared through atrophy, or if the nipple is involved, a complete amputation of the breast should be performed.

A **very extensive angioma of the mamma**, occurring in a boy 7 years of age, is reported by Althorp.¹ The growth was removed and 9 months later the boy was in perfect health.



Fig. 6.—Extensive angioma of the mamma, occurring in a boy 7 years of age (Althorp, in *Lancet*, Oct. 5, 1901).

A case of **primary carcinoma of the ampulla of Vater** is reported by Hall.² The growth occurred in a man 46 years of age. The patient suffered from all the symptoms of obstruction of the common bile-duct, the liver was greatly enlarged, and the gall-bladder distended. The patient died without operation and the autopsy revealed a soft and ulcerating mass of material lying immediately within the orifice of the common duct. The pancreatic duct was much dilated. The tail of the pancreas was dense but the head was of normal consistency. No growth was found elsewhere in the abdominal cavity. The growth, examined microscopically, proved to be a columnar-celled carcinoma.

Cumston³ presents an exhaustive critical review of the literature of **dermoid cysts of the mouth**, reporting a case of his own and presenting brief reports of 42 other cases. The author's case is that of a man 21 years of age who presented a large tumor situated in the floor of the mouth. The tumor was said to have existed since the age of 7 years, and for the

¹ *Lancet*, Oct. 5, 1901.

² *Lancet*, May 19, 1902.

³ *Am. Jour. Med. Sci.*, Mar., 1902.

past 3 years it had exhibited rapid growth. The buccal mucous membrane was perfectly normal in color and moved freely over the surface of the tumor. The salivary ducts were free. Speech was difficult and deglutition was becoming so. The cyst was extirpated through an incision in the submental region. Its contents were a grayish pasty mass which microscopically was found to contain cholesterin, hair, and elements which probably presented altered epithelial cells. For the removal of such sublingual growths Cumston suggests the following technic: An incision is made in the median line from the lower border of the jaw to the os hyoid. The muscles are retracted, the cyst exposed to view, and its adhesions to surrounding structures separated with the finger, special care being given to the adhesions binding it to the os hyoid and the genian apophyses.

Sinclair White¹ reports an interesting case of a **postrectal dermoid tumor containing true bone**. The patient was a child aged 3 years. At the time of birth the tumor was as large as a walnut. Two months before admission to the hospital the child fell, striking upon the buttocks. After the fall the tumor increased in size and



Fig. 7.—Postrectal dermoid (Sinclair White, in *Quart. Med. Jour.*, Nov., 1901).

began to be painful. It was situated between the rectum and the anterior surface of the sacrum; its cutaneous covering was tense and adherent. The growth was dissected out with little difficulty and was found to be a multilocular dermoid cyst containing a bundle of long gray hairs in one loculus, and in another two perfect incisor teeth growing from and firmly embedded in a mass of dense bone which occupied the center of the tumor and was as large as an adult patella. The patient made a good recovery, the wound healing primarily. Hall, who examined the bone, reports that

¹ *Quarterly Med. Jour.*, Nov., 1901.

"the section shows a more or less compact network of well-formed lamellar bone; it is tending to form distinct Haversian systems, and perhaps to become typical young bone formed from membrane." This case is particularly interesting because of the generally accepted statement that, except in ovarian dermoid, true bone or other mesoblastic tissue is never found.

Markoe and Schley¹ present an extensive historical consideration of **sacrococcygeal dimples, sinuses, and cysts.**

Chas. A. Powers² reports a case of **enormous sacrococcygeal tumor** in which spontaneous shrinking is undoubtedly taking place. Photographs are presented of the child at the age of 3 months and at the age of 3½ years to illustrate the atrophic change which has taken place.

Winberg³ reports a case of **inoperable recurrent spindle-celled**



Fig. 8.—Simple epulis of the lower jaw, showing condition before and after operation (Bannister, in Brit. Med. Jour., Nov. 30, 1901).

sarcoma of the upper jaw with metastases successfully treated with the mixed toxins of erysipelas and Bacillus prodigiosus. The report of the case is concluded by remarks by Wm. B. Coley, who was also interested in the treatment. This patient was operated upon on May 9, 1901, but it was found impossible to remove all of the growth. A rapid recurrence took place, and when the toxin treatment was begun the patient was in an apparently hopeless condition. At this time he was jaundiced and suffered from all the evidences of a hepatic metastasis. No improvement followed immediately after the injections were employed; in fact, the patient seemed to grow worse. At this time his vision was greatly interfered with, he had suppression of urine, and it was with the greatest difficulty that nutrition could be maintained. The treatment

¹ Am. Jour. Med. Sci., May, 1902.

² Med. News, Oct. 26, 1901.

³ Med. Rec., May 3, 1902.

was persisted in, however, and resulted in the gradual subsidence of the symptoms, both local and general. The toxin treatment was continued until January 4, 1902; in all, 103 injections were given—12 in August, 20 in September, 21 in October, 22 in November, 24 in December, and 4 in January. In January, 1902, the patient was shown by Coley to the New York Academy of Medicine. Repeated independent microscopic examinations of this growth were made, and in each instance the report of spindle-celled sarcoma was received. A minute description of the microscopic appearance is presented by William H. Welch, of Johns Hopkins University. One unusual feature of this case which Coley calls attention to is the fact that nearly all of the injections were given in the abdominal



Fig. 9.—An unusually large chondroma (Ritchie, in *Intercol. Med. Jour. of Australasia*, June 20, 1902).

wall, which fact goes to prove that the action of the toxins is systemic. Photographs of the patient, showing the progress made, accompany the report. [This case and some other undoubted successes prove that Coley's fluid does occasionally bring about a cure in the most desperate and apparently hopeless conditions.]

Bannister,¹ of Barbadoes, W. I., reports a case of **simple epulis of the lower jaw of extraordinary size** which was successfully removed by a resection of the jaw. The size of the growth and the result obtained from the operation are shown in Fig. 8.

The subject of **fibroma of the mesentery** is presented by J. B. Murphy,² who reports a case occurring in a woman 26 years of age. An ab-

¹ *Brit. Med. Jour.*, Nov. 30, 1901.

² *Med. News*, Aug. 17, 1901.

solute diagnosis prior to operation was difficult, the symptoms presented being those of uterine or ovarian rather than of intestinal tumor. When the abdomen was opened, the growth was found to spring from the mesentery; it was hard and almost equally divided into halves by the mesentery; it measured about 3 inches in diameter. The tumor, with 24 inches of the ileum, was excised and an end-to-end anastomosis established by means of the button. In an examination of the literature of the subject Murphy has been able to discover but 11 cases of fibroma of the mesentery. Cystic tumors of the mesentery occur about twice as often as solid tumors. Fibromas do not occur as near the base of the mesentery as do sarcomas. The differential diagnosis of this condition prior to operation is extremely difficult.

The accompanying illustration (Fig. 9) represents an **unusually large chondroma** reported by Ritchie.¹ The patient, a man aged 46, was in the habit of supporting the growth by a strap which encircled it and passed around his neck. The pressure from this strap resulted in ulceration, and it was this condition which caused him to apply for treatment. The tumor hung by quite a narrow pedicle from the lower part of the sternum. The growth was removed and was found to weigh 26½ pounds. The patient made a satisfactory recovery.

ANESTHETICS.

The **relative dangers of chloroform and ether** are dealt with in a paper presented before the Society of Anesthetists by Crouch and Corner.² A careful study is made of 2400 cases of ether anesthesia and 600 cases of chloroform anesthesia. The investigations of the authors related particularly to postoperative pulmonary complications. Of the 2400 ether cases, 10 developed elevated temperature with some respiratory trouble within 24 hours; all of these 10 had inhaled nitrous oxid gas previous to taking ether; there was no previous history of bronchitis in any of these patients; they were all in good condition at the time of the operation and took the anesthetic well. The operations were upon the trunk and every one was prolonged. The same conditions surrounded the 600 chloroform cases, and none of these 600 developed any form of respiratory trouble. Two patients are referred to who had previously taken ether and developed subsequent inflammation of the respiratory tract, and who were anesthetized afterward with chloroform without any such postoperative complication. One patient out of the 10 ether cases who developed respiratory trouble died of a bronchopneumonia. Chloroform is recommended by the authors for all prolonged operations on the trunk, and they approve the method of first anesthetizing with ether, and continuing the anesthesia with chloroform.

This paper was generally discussed at the meeting,³ a few of the speakers agreeing with the authors of the paper, while others thought that chloroform was not preferable to ether in long operations.

¹ Intercol. Med. Jour. of Australasia, June 20, 1902.

² Lancet, May 24, 1902.

³ Brit. Med. Jour., Jan. 18, 1902.

E. H. Embley,¹ of Melbourne, presents an extensive contribution on the **causation of death during the administration of chloroform**, setting forth the results of numerous experiments upon dogs. The attention of the investigator was directed particularly toward those sudden deaths which occur in the early period of chloroform anesthesia. The point apparently proved by this investigation is that death in such cases is due to the action of the vagus on the heart. Stoppage of the heart is rapidly followed by failure of respiration. In dogs, as soon as the heart was released from vagus control by division of the vagi its action promptly returned, circulation was re-established, and respiration soon became normal. The only question is whether this excessive action of the pneumogastric nerve is due to the influence of chloroform or is produced reflexly. The author of the paper, however, finding no evidence of the reflex nature of the action, assumes that chloroform acts directly on the vagus center. Although unable in human beings to divide the vagi, the danger may be combated by the prompt hypodermatic use of atropin.

Embley's views in regard to **the effect of chloroform on the pneumogastric nerves** are opposed by Ed. Lawrie² in two communications, and also by Barton³ in a letter. Barton cannot understand how atropin is able to reach the vagi and paralyze them if the circulation is arrested.

A death from chloroform is reported by Bayard Holmes.⁴ This is the first death in 2000 successive cases of chloroform anesthesia. It has been Holmes's custom, at the Cook County Hospital, to employ chloroform on all occasions unless ether is particularly asked for by the patient; he has always taken personal supervision of the anesthetization and has carefully trained the anesthetists. The death occurred when the author was operating among unaccustomed environments and the anesthetic was given by a physician with whom he had had no previous experience. The operation was for multilocular cyst of the left ovary with a twisted pedicle, and during the proceeding, which occupied 20 minutes, there was no anxiety as to the patient's condition. The patient was not completely under the influence of the anesthetic during irrigation of the abdomen, and consequently resisted considerably, and tossed her arms and legs about. More chloroform being administered at this time, the patient became quiet; then it was suddenly noticed that she had stopped breathing. The operator abandoned to his assistants the closure of the wound and made every effort to revive the patient; artificial respiration was kept up for some time and it seemed that occasional efforts at automatic respiration took place. But the artificial respiration became less and less effective, the patient became cyanotic, the heart stopped, and she died about an hour after the first recognition of danger. That artificial respiration was effective for a time was shown by the disappearance of all signs of cyanosis. The author thinks it a great mistake for a physician who is accustomed to administering only ether to give chloroform occasionally.

Mitchell Banks⁵ presents his impressions about **chloroform and**

¹ Brit. Med. Jour., April 5 and 12, 1902.

² Brit. Med. Jour., April 26, and May 17, 1902.

⁴ Jour. Am. Med. Assoc., Jan. 25, 1902.

³ Brit. Med. Jour., April 26, 1902.

⁵ Lancet, Nov. 16, 1901.

ether, and concludes his remarks with the statement that physiologic research is not likely to contribute toward the safe administration of anesthetics; nor does he think that much can ever be accomplished by complicated instruments with valves and stopcocks. What is needed to reduce the mortality from anesthetics is better training in our medical schools and more experience on the part of the administrator. The author urges that medical schools should devote more time to instruction on this subject, and that every graduate should have a certain amount of practical experience in the administration of ether and chloroform. [In the Hospital of the Jefferson Medical College every student gives ether under the direction of an instructor who stands directly by him in order to advise, direct, and control.]

Eisendrath¹ discusses the **accidents of anesthesia**, their prevention and treatment, concluding as follows: "(1) Limit as much as possible the administration of a general anesthetic, using the method of Schleich as much as possible. (2) Chloroform should not be given in myocarditis. In other cardiac conditions it is not as dangerous as was formerly thought. (3) Ether should not be given when there is any hyperemia or stenosis of the respiratory tract. (4) Chloroform should not be given in the status thymicus. (5) Ether is in general contraindicated in diseases of the kidney. (6) Chloroform causes fatty degeneration of the heart-muscle, liver, and kidney in prolonged administration. (7) With chloroform the anesthetizer should watch the pupils, pulse, and respiration constantly. (8) We can avoid chloroform syncope by keeping the head low and turned on one side, and avoid the pulmonary complications of both ether and chloroform by keeping the head below the level of the body to allow the mouth secretions to run out, by preventing the chilling of the patient, and avoiding conditions which favor hypostasis and interfere with action of diaphragm. (9) The order of procedure in case of syncope should be understood by all who are responsible for patient: viz., raise foot of table, artificial respiration, massage of heart, rhythmic tractions of tongue, and intravenous transfusion. If these are of no avail, the method of Prus, exposing heart and making direct mechanical stimulation, or intratracheal insufflations. Hypodermics are of little avail until the heart beats."

The fact that **chloroform is capable of producing serious trouble when used in the presence of gaslight** is shown by an article by Gerlinger.² In the case reported the operation, undertaken for a gunshot wound of the abdomen, occupied 3 hours, chloroform being used as the anesthetic. Two physicians and four hospital sisters who were present were each attacked by severe spasms of coughing during the operation, but later when they breathed fresh air, became apparently perfectly well. Three hours after the operation, however, all showed more or less pronounced symptoms of poisoning. These signs consisted in cyanosis, difficulty in breathing, and signs of oppression, and, in two instances, collapse. One of the sisters died 2 days after the operation. Her blood when examined was found to contain no CO. The blood was examined because the

¹ Chicago Med. Recorder, April 15, 1902.

² Arch. f. exper. Path. u. Pharm., Bd. XLVII, Hefte 5 u. 6.

poisoning in these cases is supposed to be due to the decomposition of chloroform in gaslight, resulting in the formation of COCl_2 , a very irritating gas. The gas has a peculiar odor and produces white clouds in a moist atmosphere. Gerlinger has been able to demonstrate the formation of the gas from chloroform in the presence of gaslight, but has been unable to overcome its dangers. [All of us at some time or other have experienced the peculiarly harassing and persistent cough developed by giving chloroform in a room containing a gas-jet flame or candle-light. The sensation is identical with that produced by the inhalation of HCl gas. Kunkel maintains that HCl is responsible, and Bosshard has pointed out that under the conditions specified above chloroform is decomposed into Cl , HCl , and CCl_4 . The irritating cough can be greatly mitigated by having a free flow of air into and from the room.]

Becker¹ recommends the **combination of the pure oil of turpentine or the oil of *Pinus pumilio* with ether** in order to prevent the bronchorrhea resulting from ether-anesthesia or the aggravation of any existing inflammatory condition of the lungs. Because of its pleasant odor Becker prefers to use the oil of *Pinus pumilio* (Latschenöl). The oil may be added to the ether in the proportion of 20 drops to about $6\frac{1}{2}$ ounces; more oil can be added without harm, but no advantage is to be derived from it. Becker has employed this combination of ether and turpentine in 500 cases with perfectly satisfactory results. Even in cases in which there existed some pulmonary irritation and in old people the ether did not produce the usual irritation with excessive bronchial secretion. [For nearly one year it has been largely used in the Jefferson College Hospital, and the anesthetists believe it distinctly lessens the amount of mucus poured out. The proportions used are 3 drops of the oil to $\bar{5}$ j of ether.]

Complete relaxation of the abdominal wall under anesthetics is discussed by Blumfeld.² In most cases complete relaxation can be obtained if deep anesthesia is produced by chloroform. There are, however, cases in which complete relaxation cannot be obtained. In order to produce complete relaxation all cyanosis and all obstruction to breathing must be avoided and the anesthesia must be deep enough to keep the respiratory center from being readily interfered with by different impulses. The causes of rigidity of the abdominal wall are: "(1) Cyanosis from whatever reason; (2) any obstruction of the air-way; (3) not enough anesthetic; and (4) too much anesthetic." As a rule, the best way to anesthetize these cases is by inducing anesthesia with gas and ether and then changing early to chloroform. The chloroform should be sparingly given at first but can later be pushed. Chloroform should be used in this way, however, only by an experienced anesthetist. Often a combination of ether and chloroform, in the proportion of 2 parts of chloroform to 3 parts of ether, is useful. The free administration of air with the anesthetic offers often a better chance of obtaining that perfect flaccidity of the abdominal wall which is the aim of the anesthetist and the comfort of the surgeon. Since frequently in these cases of rigid muscles the patient at the completion of the operation is completely relaxed, it is suggested that when this condi-

¹ Centralbl. f. Chir., June 1, 1901.

² Lancet, May 31, 1902.

tion is anticipated the ether should be begun much earlier than is generally the case. The most marked rigidity is usually found in operations upon the upper abdomen, and when it cannot be overcome it is probably due to one of four conditions: "(1) The shape of the trunk as it affects the upper portion of the recti muscles; (2) the thickness of the abdominal wall, particularly if due to muscular development; (3) the pathologic condition of the recti muscles due to underlying disease; and (4) to these may perhaps be added abnormal sensibility to reflex effects." [Mr. Frederick W. Hewitt, in his admirable treatise upon anesthetics, makes the following impressive remarks regarding abdominal rigidity. After pointing out that in most cases the anesthetist should obtain full anesthesia with absence of abdominal rigidity, he shows that intraabdominal manipulation is apt to excite "reflex rigidity, causing breathing from reflex laryngeal spasm, and other inconvenient symptoms even in deep anesthesia." Further, there are "certain cases in which complete abdominal relaxation is only to be secured at the risk of respiratory depression. This is not to be wondered at; for whilst inspiration under anesthetics is largely diaphragmatic, expiration is often to a great extent dependent upon the contraction of the abdominal parietes. In other words, it is often this expiratory action of the abdominal muscles which the surgeon finds inconvenient. I believe I am right in saying that whilst it is safe in nearly every case to obtain complete abdominal relaxation, it is not safe in all; for I have notes of more than one case in which, wishing to help the surgeon as much as possible, I have carried the administration of chloroform to the point of incipient respiratory failure before I could produce thorough muscular relaxation." Hewitt considers that laryngeal spasm in such cases is commoner when chloroform is used than when ether is employed, and if the laryngeal spasm becomes inconvenient under chloroform a change to ether may be effected.]

J. M. T. Finney¹ presents an analysis of 142 cases of **anesthesia in the presence of heart disease of both functional and organic variety**. The author states that anesthetics produce unfavorable symptoms only in cases of affections of the myocardium. The symptoms produced in these cases are a rapid but weak pulse with some irregularity, cyanosis, and disturbed respiration. In cases of valvular diseases the bad effects of the anesthetics are not marked. In functional heart troubles but slight disturbance is noticed. Chloroform is much more apt to produce the symptoms than ether. Finney emphasizes the fact that in every operation the anesthetist plays almost as important, and in some cases a more important, rôle than the operator, and that reform in the method of teaching anesthesia is badly needed in our medical schools.

Hobart A. Hare² discusses the **safest anesthetic in organic diseases of the heart and vessels**. The author expresses the belief that in the majority of instances when accidents occur during the administration of an anesthetic the shock of the operation rather than the anesthetic is to be blamed for the fatal result. In many cases the patient's condition improves with the production of anesthesia. One point which is fre-

¹ Am. Jour. Med. Sci., Aug., 1901.

² Am. Jour. Med. Sci., Aug., 1901.

quently not taken into account by the surgeon is the fact that in valvular disease of the heart there is very little reserve power, and when shock occurs the heart cannot meet the conditions which are present. In many cases where there is high arterial tension the administration of ether is contraindicated, since this agent increases the arterial tension. The employment of atropin as a stimulant of the vasomotor system is strongly recommended. This remedy is particularly to be employed when the respiration is difficult from apparent edema or diffuse capillary bronchitis. When oxygen is given with ether, Hare thinks that the two should be administered separately, so that the amounts of each may be regulated. When ether is properly given, he believes that it is the safest anesthetic, except in valvular disease of the heart. In atheromatous conditions, and also when high arterial tension is the result of valvular changes, ether is contraindicated. Bright's disease is not considered a strong contraindication to the employment of ether. The use of chloroform in the presence of myocardial change is very dangerous. In cases of vascular degeneration nitrous oxid is contraindicated. Hare refers to 2 cases of fatal apoplexy following the administration of nitrous oxid to such patients. It is thought that spinal anesthesia will soon be looked upon as a medical curiosity.

John Freeman,¹ in a clinical lecture on the **quiet production of anesthesia**, offers some very practical advice. Most of the deaths occurring during anesthesia take place when the patient is "going under," so that this period may be looked upon as the dangerous one. In the majority of cases with the exercise of sufficient care the patient may be made to pass into the state of narcosis as quietly as he would fall into a natural sleep. A preliminary examination of the heart and lungs is necessary, but if made at the time of anesthetization it should be brief, or else the prolonged application of the stethoscope is apt to alarm the patient. Everything possible should be done to allay the patient's nervousness and anxiety, both regarding the anesthetic and the operation. Absolute quiet should be observed and the patient told to breathe naturally and not instructed to take deep breaths with the mouth open. "The more passive you can make him, the better; any active assistance does more harm than good." A great deal can be accomplished by the "suggestion" of sleep, the patient being instructed to close the eyes. He is then allowed to breathe through the inhaler before the anesthetic is applied. When regular breathing has been secured, the anesthetic should be dropped on in gradually increasing amounts. Any hesitation or coughing at this stage shows that the vapor is too strong. A weak vapor breathed quietly and regularly is more effectual and safer than a stronger one taken intermittently. Forced respiration only tires the patient and causes him after a short time to cease breathing. Any rough treatment, such as shouting at the patient or slapping his face, is not permissible, as it only alarms him and will frequently cause him to struggle. The too energetic testing of the corneal reflex in the early stage of administration is a mistake. Freeman says that he has frequently seen patients who are going under

¹ Bristol Med.-Chir. Jour., Dec., 1901.

the anesthetic quietly much disturbed and made restless by the frequent testing of the corneal reflex. A frequent error is that of holding the patient at the first evidence of struggling; such interference only increases the patient's fear and struggling. Trouble is also frequently caused by the too early interference with the patient for the purpose of removing dressings, clothing, etc.

Wm. C. Riley¹ discusses the **selection and sterilization of cocain**. The author shows that this drug is sold to the profession in many variations of strength and purity, and quotes extensively from an article by Tuthill² showing the impurities usually met with. Riley asserts that many of the disappointments encountered in the employment of local or spinal anesthesia may be traced to an impure drug. In choosing cocain one should select that occurring in anhydrous, well-defined, rather large, colorless, and nearly odorless crystals. Silky hydrated crystals containing 2 molecules of water of crystallization are not fit for surgical use. Riley refers to the great variety of methods employed for the sterilization of cocain and describes one which he has found most satisfactory, experimentally and clinically.

"Carefully selected muriate of cocain is broken in a mortar into moderately fine fragments and heated in a dry sterilizer to 110° C. [230° F.] for about 20 minutes and then bottled in a clean, dry bottle with a tightly fitting rubber stopper. This insures a dry salt to begin with, which is quite essential for the after-process. Small graduated vials or glass tubes are taken and carefully cleansed, dried and flamed, and when cool such an amount of the cocain is weighed off into each as will make, when the vials are filled to this mark with sterilized water, a 2 % solution. The mouth of the tube is then closely stoppered with a plug of freshly dry-sterilized absorbent cotton (150° to 160° C. [302° to 320° F.] for 1 hour). It is then placed in a dry sterilizer and the temperature gradually raised to from 145° to 150° C. (293° to 302° F.) and maintained at that temperature for from 10 to 60 minutes. Ten minutes is usually sufficient time to fulfil all bacteriologic requirements, but there might be a possibility of contamination with certain spores which would require the longer period.

"One hour's heating of this dried cocain at this temperature does not impair its efficiency, notwithstanding many statements in the books to the contrary. After cooling, the vials may be taken out at one's leisure, and after the cotton plugs have been withdrawn with sterilized forceps, be stoppered with sterilized rubber stoppers, or, which I prefer, ordinary well-fitting corks which have been plunged in a wax resin mixture heated to 170° C. (338° F.); or the end of the tube softened in the flame, drawn out, and sealed.

"To sum up the advantages offered in this method of preparation: (1) Perfect sterility. (2) The product, being dry, lasts an indefinite time, the only thing being necessary when required for use is to sterilize the outside of the container in any convenient manner except boiling—as, for instance, simply flame the cork and neck of the vial, allowing it to become cool be-

¹ Med. Rec., Aug. 10, 1901.

² Druggists' Circ. and Chem. Gaz., vol. XLII, No. 8.

fore adding water. (3) No necessity to weigh or measure the cocain or water at the time of the operation. (4) Absolute efficiency.

"This method is so simple that the author hopes it will be generally adopted not alone for spinal, but for any kind of cocain anesthesia where perfect sterility is advantageous."

Illing¹ describes his experiences in the use of **tropacocain in the production of spinal anesthesia**. The author employed the drug in 49 operations and found it very satisfactory. The advantage possessed by this agent is that it can be boiled, although repeated or prolonged boiling reduces its strength about one-half. The author has found that the disagreeable symptoms produced by cocain are usually absent when tropacocain is employed. The drug is less than half as toxic as cocain and the relation between toxicity and dose is more constant than with cocain. Its action is a little slower than cocain, but the recovery from its effects is more rapid. Anesthesia seldom appears earlier than 10 minutes after the injection. The complaints of thirst, heat, vomiting, pallor, nausea, and perspiration seldom follow the use of the drug. Relaxation of the sphincters, however, with involuntary evacuations, occurred in two of the author's cases. The largest amount of the drug employed was 1 grain. The anesthesia in this case lasted 3 hours and 8 minutes.

Neugebauer² has used **tropacocain to produce spinal anesthesia** with satisfactory results. The author described the technic of the operation of injecting the fluid. He found that the analgesic effect of the drug usually begins in the anal region a minute or two after the injection. The drug was used in doses from $\frac{1}{2}$ grain to $1\frac{1}{2}$ grains. In two instances the after-effects of the drug were alarming; these, however, were attributed to carbolie acid which was in the syringe. Out of 60 patients, 15 had headache, 7 had a rise of temperature, 3 had vomiting, 3 had paralysis of the sphincter ani, and 1 paralysis of the lower extremities. Neugebauer's article closes with a report of his cases in which tropacocain has been used.

G. R. Fowler³ reports 3 cases in which he has found the **simultaneous employment of analgesia obtained by spinal cocainization and ether or chloroform narcosis** to be of great advantage. The combination of these two methods is particularly applicable to those cases in which there is reason to dread the mental effects resulting from the knowledge on the part of the patient that an operation is being performed. After the injection of the cocain in the subarachnoid space the amount of ether or chloroform required is very small.

A. W. Morton⁴ is a strong advocate of the **subarachnoid injection of cocain** for operations on all parts of the body. He considers this method safe and reliable, regardless of age, sex, or disease, and one which has no contraindications. Morton claims that the symptoms following the employment of spinal cocainization are not due to cocain, and that he has had the exact symptoms follow the injection of normal salt solution.

¹ Jour. Am. Med. Assoc., Mar. 22, 1902.

² Wien. klin. Woch., 1901, Nos. 50, 51, and 52.

³ Amer. Med., Oct. 19, 1901.

⁴ Amer. Med., Aug. 3, 1901.

When patients are very nervous, a hypodermic of morphin, $\frac{1}{4}$ of a grain, and strychnin, $\frac{1}{30}$ of a grain, half an hour before the operation, is of great value. After the introduction of the needle, should the cerebrospinal fluid not pass, the obstruction may be removed by passing the stylet, by making suction on the syringe, or by having the patient cough. Morton does not advise that the injection be made above the second lumbar vertebra. In 253 cases he has seen alarming symptoms on only one occasion, and in this case the symptoms were due to the removal of a considerable amount of cerebrospinal fluid for analysis. In one of his early cases the patient complained of headache for 4 days, but in none of his last 200 cases has the headache lasted over 12 or 24 hours, and it has always been relieved by the administration of 3 to 5 grains of antipyrin and $\frac{1}{2}$ of a grain of caffein. The 253 patients in which the injection has been employed varied in age from 8 to 86 years, and many of them suffered from organic disease of the kidneys, heart, and lungs. In these cases nausea was present in 65, emesis in 53, headache in 37, involuntary evacuations of the bowels in 9, postoperative chill in 6. Out of the 253 patients 6 have died, but their death could not be attributed to the method.

Sherrill,¹ after a discussion of the literature of **analgesia from spinal subarachnoid injection of cocain**, presents brief histories of 27 cases in which he has employed the method, and reaches the following conclusions: "That cocain analgesia is not likely to prove satisfactory in operations above the level of the diaphragm; that probably it will not be much used in abdominal cases which are not clear, and are likely to prove tedious or difficult; that its special field will be found in operations upon the lower extremities, including amputations and resections, and upon the perineum, bladder, and rectum; also that it is useful in operations on old persons and those suffering from diseases of the heart, lungs, or kidneys, from cirrhosis of the liver, and from abdominal dropsy; and that it can be successfully employed when a patient fears general anesthesia. If we neglect this method in the proper cases, we certainly throw aside a valuable addition to our armamentarium."

An article by Ravaut and Aubourg,² on the **cerebrospinal fluid after cocainization**, is discussed editorially in the "Philadelphia Medical Journal," October 19, 1901. The idea of relieving the headache so frequently complained of after spinal cocainization suggested the advisability of a second lumbar puncture for the purpose of removing some of the fluid from the spinal canal in order to diminish any tension which might be present. The headache was relieved by the removal of the fluid, and, moreover, it was observed that the headache varied in proportion to the amount of fluid within the canal. When the headache was intense, the authors were able to withdraw as much as 20 cc. of turbid fluid. An examination of this fluid showed the presence of polymorphonuclear leukocytes, "which in some instances formed a true clot of pus in the bottom of the centrifuge tube." In other instances a fibrin clot formed after the fluid was allowed to stand for a time. In cases where there was no headache a very slight polymorphonuclear reaction was noted in the cerebrospinal

¹ Amer. Med., Oct. 26, 1901. ² Gaz. Hebd. de M  d. et de Chir., June 27, 1901.

fluid. Out of 21 specimens of fluid obtained by a second lumbar puncture, in only one instance was the fluid found to be perfectly normal. In those patients in whom there was a marked repeated reaction, lumbar punctures were made and showed that in from 8 to 20 days the polymorphonuclear reaction gave place to lymphocytic reaction, which in turn disappeared, leaving the fluid normal. The authors exclude all sources of infection and conclude that cocain was responsible for the changes produced in the cerebrospinal fluid, and that its action on the pia mater and arachnoid was similar to that of a toxin.

Bousquet¹ presents a report of a case in which death occurred after a **subarachnoid injection of 5 cgm. of eucain**. The case was one of strangulated femoral hernia in a woman 31 years of age. The patient at the time of operation was in a very weak condition. Soon after the injection was made symptoms of collapse appeared requiring vigorous stimulation and artificial respiration. After three-quarters of an hour consciousness returned, but a few hours later the patient went into collapse, and died in spite of a repetition of the treatment which had proved successful in the first instance.

Guinard,² in producing **cocainization of the spinal cord**, employs as a medium for the cocain the cerebrospinal fluid. A small quantity of the fluid is withdrawn, and to it is added the required amount of a concentrated solution of cocain, and this solution is then injected through the needle. The author claims that the unpleasant symptoms which accompany the use of aqueous solutions of cocain result from the water and not the cocain, and therefore he suggests the substitution of the cerebrospinal fluid. He states that he has employed this method in 70 cases without any unpleasant after-effects.

Two deaths from spinal anesthesia produced by cocain are reported by Leguen.³ Both patients were men, one aged 64 and the other 61. The first patient was operated upon for a rupture of the ligamentum patellæ and died during the operation. The second case died during an operation for hernia. In the first case 2 cgm. of a 1% solution of cocain was employed, and in the second case 1.5 cgm.

Dudley Tait⁴ describes the **epidural method of producing analgesia and its indications**. It is shown that if a colored fluid is injected into the epidural space at the level of the sacral canal it will ascend to the foramen magnum, where it will stop abruptly. It will not enter the subarachnoid space or come in contact with the nerve-substance; if, however, the same injection is made at the lowest point of the sacral canal, the fluid will stain the pelvic cellular tissue and that of the ischiorectal fossæ. This is explained by the absence of dural adhesions at the intervertebral foramina in the lower third of the sacral canal. The method of giving the epidural injection into the sacral canal is described as follows: "The last two posterointernal sacral cornua are easily felt under the skin at a point situated 1 cm. or 2 cm. above the intergluteal fold; at this level there is a triangular space closed by the sacrococcygeal ligaments, limited

¹ Gaz. des Hôp., July 13, 1901.

² Presse Méd., No. 90, 1901.

³ Presse Méd., No. 91, 1901.

⁴ Amer. Med., April 12, 1902.

laterally by the sacral cornua and above by the median sacral cornua. In many individuals the space can be located by simple inspection; a triangular flat surface is seen just below the convex bulging ridge formed by the first sacral vertebra. In stouter patients, particularly in the female, digital exploration becomes necessary to determine the exact position of the three sacral cornua. The distance between the triangular sacrococcygeal space and the point of the coccyx is from $6\frac{1}{2}$ to 7 cm. With a little practice the finger will locate rapidly and accurately the site of puncture. Beginners are apt to make the puncture too low. The middle of the triangular space is the best site for puncture. The needle should be introduced obliquely and in the median line in order to avoid injuring the coccygeal nerves or ganglions, and then pushed to a depth of 3 to 5 cm. Cathelin, for the already mentioned anatomic reasons, advises puncture near the upper angle of the sacrococcygeal triangle, and the introduction of the needle as high as the third sacral vertebra (5 cm.).” This puncture is seldom painful, although it may be advisable under certain circumstances



Fig. 10.—The needle is in the sacral canal (Tait, in *Amer. Med.*, April 12, 1902).



Fig. 11.—The cross indicates the sacrococcygeal space or site of puncture (Tait, in *Amer. Med.*, April 12, 1902).

to employ a local anesthetic. An abundance of adipose tissue interferes with the location of the canal. In two very obese patients Tait failed to locate the space by the ordinary method. Occasionally patients will complain of a dull ache in the back after the injection, but none of the severer symptoms which accompany the subarachnoid injections occur. Pressure symptoms need not be feared. The drugs employed in the epidural method are cocaine, antipyrin, chloroform, tropacocain, and physiologic salt solution. Cathelin was the first to describe and use the epidural route. The method is employed to check pain in such conditions as sciatica, lumbago, herpes zoster, fulgurant pain, intercostal neuralgia, gastric and vesical crises, etc. The most satisfactory results have been obtained in cases of sciatica, the relief in these cases being immediate and complete. A number of writers describe the effects of this method as remarkable. In cases of sciatica free from neuritis 3 injections made at intervals of 3 days generally prove successful. In sciatica due to neuritis

or myelitis the injections give only temporary relief. The analgesia obtained is to a degree independent of the nature of the substance injected, very cold normal salt solution acting more rapidly than cocain. In cases of hepatic and nephritic colic Widal has obtained excellent results from the epidural injections of cocain. Tabetic pains are also said to be relieved by this method. The analgesia produced in this way is not of sufficient depth to admit of operative work. "Cathelin believes that the epidural method may be utilized for the majority of soluble medicaments; he strongly urges injections of cyanid or benzoate of mercury in malignant or cerebrospinal syphilis." From a medical point of view the epidural route possesses many advantages over the subarachnoid.

Delaup¹ presents his experience with **spinal analgesia**, which extends to 22 cases. In all but two of these cases the analgesia was absolute and complete; no symptoms of shock followed the operation in any case, and the patients returned more rapidly to the physiologic condition than after general anesthesia. In children and nervous women the method cannot be employed. Although not considering this method an ideal one, Delaup believes that it possesses a special sphere of usefulness not only in genitourinary and rectal surgery, but also in surgery of the lower extremities.

A very thorough **experimental research into the effects of cocain and eucain** is reported by Geo. W. Crile,² who fortifies his conclusions by corresponding clinical results. The first part of the article consists in a tabulated account of his experiments upon animals with the introduction of cocain and eucain into nerve-trunks and into the spinal cord. He shows that the injection of cocain into a nerve-trunk produces an absolute block to both afferent and efferent impulses, and that therefore any operation done upon the parts supplied by this nerve is not productive of shock such as does occur when a general anesthetic is employed. Crile also made experiments with the intraspinal and subarachnoid injections. He then reports several major operations performed under local anesthesia produced by the injection of cocain and eucain directly into the nerve-trunks. He has 5 times performed amputation of the leg below the knee, and in 4 of these cases the patient was not aware of the operation until told of it afterward. The recorded cases go to show that absolute anesthesia can be produced, particularly in the extremities, and operations performed not only without pain but without shock when a weak solution of cocain is carefully injected directly into the nerve-trunks supplying the parts. The author's clinical summary is as follows: "In the clinical use of cocain and eucain particular attention is called to a most important feature: viz., that shock is almost wholly avoided, because all afferent impulses are blocked. It is now known that afferent impulses set up by injury or operation are the causes of shock. These impulses are but slightly modified by general anesthesia. The afferent impulse, constituting pain, is abolished by general anesthesia, but those affecting the vasomotor, the respiratory, and the cardiac mechanism

¹ New Orleans M. and S. Jour., Oct., 1901.

² Jour. Am. Med. Assoc., Feb. 22, 1902.

isms are not controlled; but cocain or eucain absolutely blocks their passage, making a physiologic amputation of the part. These anesthetics wholly prevent reflex inhibition, the principal causes of collapse in certain operations and injuries, *e. g.*, operations on the larynx and pharynx. Given hypodermically, the experimental evidence shows that they diminish shock in operations on the splanchnic area and absolutely alter this area in the processes of operation or exposure, as abundantly proved by the series of double experiments. I have had but two opportunities of

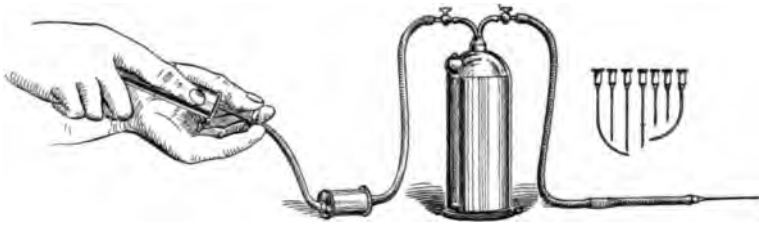


Fig. 12.—Apparatus for rapid, massive infiltration anesthesia. Charging the cylinder with air-pump (Matas, in Amer. Med., Dec. 28, 1901).



Fig. 13.—Cylinder charged and inverted. The pumping outfit is detached when the apparatus is in operation (Matas, in Amer. Med., Dec. 28, 1901).

testing this clinically, both in operations for gunshot wounds of the intestines, and in each the experimental evidence seemed to be corroborated. Comparative results require such a large number of observations that I prefer for the present to offer no more than the clinical suggestion."

Matas¹ has made an improvement upon his apparatus (see YEAR-BOOK, 1902) for making **massive infiltration in the production of local anesthesia**. The objection to the former apparatus was that the compressed air resulted in frequent breakage of the receptacle. The new

¹ Amer. Med., Dec. 28, 1901.

apparatus, which is shown in the accompanying illustrations, consists of a copper cylinder, nickel-plated within and without, the top of which is provided with a metal T-tube allowing the air to enter and the fluid to escape. The cylinder has been tested to stand 147 pounds of internal hydrostatic pressure to the square inch. The receptacle is filled through the bottom, which is made to screw on tightly over a rubber washer. On the side of the cylinder there is a glass gage to indicate the amount of fluid within. The air is injected into the reservoir by means of an ordinary bicycle pump through a small metallic cylinder which is filled with sterile absorbent cotton. The advantages claimed for this apparatus over the ordinary infiltration syringes are: "(1) That it allows the operator to infiltrate and edematize large areas rapidly, continuously or interruptedly, without the delay caused by recharging or exchanging syringes; (2) that by the use of long needles it tends to diminish the traumatism caused by frequent punctures made necessary by the shorter needles used with the ordinary quickly exhausted syringes."

Goldan¹ discusses the **use of ethyl bromid and chlorid as general anesthetics** and describes an apparatus for their administration. These drugs, like chloroform, have a halogen derivation and must be classed as intense poisons, and consequently the greatest care should be observed in their administration. They can only be employed for brief operations, and therefore the results obtained cannot be compared to those of chloroform

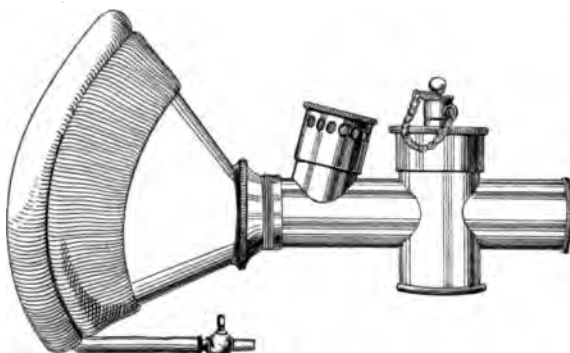


Fig. 14.—Goldan's Inhaler. The complete apparatus (N. Y. Med. Jour., Dec. 14, 1901).

or ether, which agents are employed also in prolonged operations. If ethyl bromid and chlorid were used in the same cases as chloroform, these agents would be much less safe than either chloroform or ether. In operations of very brief duration, however, they are probably superior in safety and other respects to chloroform. Deaths from these agents are not only asphyxial (respiratory), similar to that caused by nitrous oxid, but vasomotor, similar to that caused by chloroform. Ethyl bromid is considered safer than ethyl chlorid, since it does not require the same concentration. Anesthesia is induced very rapidly and consciousness is regained very quickly. Nausea and headache occur about as frequently as after the use of nitrous oxid. These agents as well as nitrous oxid are particularly valuable as precedents to ether in general anesthesia. As precedents to chloroform they are quite unnecessary, if not dangerous. Ethyl bromid and chlorid should always be administered with the patient

¹ N. Y. Med. Jour., Dec. 14, 1901.

in the recumbent position, and this position should be maintained; consequently they are less applicable to certain minor operations than is nitrous oxid. In employing these agents it is far better and safer to use a larger quantity of the anesthetic with a free complement of air than a smaller quantity with a smaller proportion of air. The apparatus described by Goldan is one in which ethyl bromid and chlorid can be administered alone or in which these agents can be employed as precedents to ether without the change of inhalers.

Ware¹ discusses the value of **ethyl chlorid as a general anesthetic, and compares it with nitrous oxid gas**. The simplicity of the method recommends it very highly. The author's experience extends over 400 cases, and among these he has noticed no ill effects from the use of the agent. It is stated, however, that as an anesthetic the administration was not successful in every case, the failures being put down at 5 %. Ethyl chlorid should be used only in the performance of minor operations or as a preliminary to the administration of ether and chloroform. The latter use of the agent is of great value, as it prevents the distressing symptoms which are present in the early stages of ether and chloroform anesthesia.

McCardie² reports his experience with **ethyl chlorid narcosis**, and relates briefly the history of 26 cases of minor operations which had been performed with the use of this anesthetic. The longest anesthesia lasted about 16 minutes; in this case previous anesthetization with chloroform had given rise to serious symptoms. Hypertrophied tonsils and adenoids were the conditions most frequently operated upon. A peculiar rash developed during the anesthesia in one case; in another instance great muscular excitement rendered complete anesthesia impossible. This patient was not an alcoholic. In another case death occurred about an hour after the narcosis. The patient had made a good recovery without any after-effects, but postmortem showed advanced disease of the heart and other organs, and this condition was supposed to be the cause of death. Ethyl chlorid is not held accountable for the death, since no symptoms were present during its administration. The author used, on an average, about 10 cc. of the agent in each case. The drug should be given gradually and never "crowded."

Marvel³ reports 36 operations in which he has employed **ethyl bromid as a primary anesthetic to ether or chloroform**. Ethyl bromid is taken easily, the patient seldom making any resistance. The action of the drug is quick and in none of the cases reported did any unfavorable symptoms arise. Ethyl bromid acts as a sedative to the mucous membrane of the respiratory tract and prevents the coughing and excessive secretion which accompany the use of ether. In 34 of the 36 cases one fluidram was sufficient to produce unconsciousness. The time required to produce complete anesthesia varied from 2 to 5 minutes.

Madura⁴ commends the use of **nitrous oxid followed by ether in throat operations**. The usual time required to produce anesthesia by

¹ Med. News, Aug. 3, 1901.

² Lancet, June 20, 1901.

³ Amer. Med., Oct. 26, 1901.

⁴ N. Y. Med. Jour., Feb. 22, 1902.

this means is 5 minutes. The unpleasant effects of the ether are avoided and there is but little struggling on the part of the patient. During the first minute of etherization, especially in patients with adenoid growths and enlarged tonsils, there is a tendency to considerable spasm of the upper respiratory passages.

Mosher¹ recommends the employment of an **ether spray** in front of the patient's mouth during operations upon the nose and throat, and describes the method of administering the anesthetic in this way with the patient in a sitting posture with the head and body leaning slightly forward. The advantages claimed for the method are that there is no interruption to the giving of the anesthetic during the operation, and that the sitting posture permits of the artificial illumination of the field of operation. He has not found that the sitting posture adds to the danger of the anesthetic.

Korff² discusses **Schneiderlin's anesthesia** and describes his experience with a modification of this method in 80 cases. He employs hydrobromate of hyoscin $\frac{1}{16}$ gr., morphin $\frac{1}{4}$ gr., hypodermically, which is repeated after 2 hours; then a few drops of chloroform are sufficient to produce complete anesthesia. The patients all slept for a number of hours after the operation and did not complain of pain. The method is considered absolutely free from danger. In but one of the 80 cases were there any unpleasant symptoms; in this case the pulse dropped to 46.

ESOPHAGUS AND STOMACH.

Primary sarcoma of the esophagus and stomach is discussed by Wm. T. Howard.³ He reports a case of the former condition, and after studying the literature on that subject reaches the following conclusions: "Analysis of the 12 recorded cases of sarcoma of the esophagus shows the following: (1) The disease is more common in males than in females, and at the period of life during which carcinoma most frequently occurs. It may, however, unlike carcinoma, occur in early life—between 4 and 25 years. (2) Of the 12 cases, 9 involved the lower half of the organ. (3) While the tumors usually nearly surround the lumen, in 3 cases they formed pedunculated or polypoid masses projecting into the lumen. (4) Symptoms of esophageal obstruction occurred in 11 of 12 cases. (5) There was perforation with involvement of the respiratory organs in 4 cases. (6) All the varieties of sarcoma except angiosarcoma have been found, the round-cell variety standing first in frequency—one-fourth of the cases. (7) Metastases occur rather frequently (5 out of 12 cases), and in 2 cases were widespread. (8) The clinical diagnosis of esophageal sarcoma has not been made and there are no certain and constant diagnostic points between sarcoma and carcinoma of this organ, the clinical symptoms being necessarily very much the same and dependent upon the same conditions—obstruction and cachexia—in the two diseases. (9) As pointed out by both Livingood and Stark, sarcoma runs a more rapid

¹ Boston M. and S. Jour., Jan. 23, 1902. ² Münch. med. Woch., July 10, 1901.

³ Jour. Am. Med. Assoc., Feb. 8, 1902.

course, and a fatal issue must be looked for earlier than in carcinoma. The greater size of the sarcomatous growths is probably responsible for this. (10) The differences in the character, distribution, and period of the pain in the two affections described by Stark are not mentioned by other observers. It would prove a matter of considerable importance if his experience is confirmed."

After discussing at great length sarcoma of the stomach, the author reaches the following conclusions: "(1) Gastric sarcoma is more common than is generally supposed, at least 61 cases being recorded. Careful routine microscopic examination of all gastric tumors met at autopsy and operation will probably show a marked increase in the occurrence of these tumors. (2) The two sexes are affected in about equal proportions, as against 5 males to 4 females for carcinoma; 37.7 % of the cases occurred below the fortieth year, and 11.44 % (7 cases) below the twentieth year. (3) The pyloric end was involved in only 26.23 % of the cases, as against 60 % for carcinoma (Welch), and caused stenosis in only 8.19 % of the entire number of cases. Diffuse growths occurred in 21.31 %, while the cardia was involved in only 4.9 %. The posterior wall and greater curvature are commonly involved. (4) Gastric sarcoma may reach a large size, that of a child's or man's head, and may project as large masses into the lumen of the stomach or into the peritoneal cavity, extending below the umbilicus—13.1 %. Such tumors have been mistaken for tumors of the spleen, omentum, and ovaries, and may be pedunculated and readily removed. (5) Gastric sarcomas commonly start in the submucosa or muscularis and are less apt to ulcerate and cause hemorrhage than carcinomas. (6) All the histologic varieties of sarcoma have been found in the stomach. (7) While most of the cases in which the duration of the illness was mentioned ran an acute course, the average duration of life is probably from 9 to 10 months, while in one case it was 3 and in another 5 years. (8) Metastasis is not as frequent as in carcinoma, but may be widespread. The liver was invaded in only 7 cases—11.47 %—in striking contrast to gastric carcinoma, which, according to Welch's statistics, invaded this organ in 30 % of cases. (9) There are no distinctive clinical symptoms or physical signs of sarcoma of the stomach, but a positive diagnosis has been made in 3 cases from microscopic examination of material obtained from the stomach. (10) In cases of large tumors connected with the stomach, especially when they project to or below the umbilicus, a diagnosis of sarcoma of the stomach is warranted. A tumor of the stomach in an individual under 20 years of age is almost certainly sarcoma. In our series 37.7 % of the cases were under 40, while in Osler's 150 cases of carcinoma of the stomach only 15.3 % were under this age. (11) Operation should be as successful in sarcoma as in carcinoma of the stomach."

The origin of carcinoma of the stomach from chronic round ulcer of the stomach is extensively considered by G. Fütterer,¹ who reaches the following conclusions: "(1) If a carcinoma develops from a chronic ulcer of the stomach, then this development occurs from those

¹ Jour. Am. Med. Assoc., Mar. 15, 1902.

parts of the edges of the ulcer which are most exposed to mechanical irritation by the contents of the stomach. (2) In the pyloric region it is the lower pyloric margin of the ulcer which is most exposed to mechanical irritation and from which carcinoma develops. But other parts of the edges may be the ones involved when dilations and adhesions have changed the position of the organ. (3) Development of carcinoma from ulcers of the stomach in the pyloric region occurs with great frequency, while such a development occurs less often in other parts of the stomach. (4) If what has been said under our third conclusion is correct, then we must, in all cases in which an ulcer of the stomach or its scar narrows the pylorus, recommend early a gastroenterostomy, to prevent the development of carcinoma. If a gastroenterostomy has been made, then the mechanical irritation of the ulcer in the pyloric region by food is reduced, and the severe friction necessary to produce a carcinoma will probably not occur. (5) A patient suffering from the consequences of a stenosis of the pylorus, particularly if this is caused by ulcers and scars, should, if a gastroenterostomy is not performed, be advised to eat slowly and little at a time, and to be particularly careful about carbohydrates and especially hard crusts of bread; they should avoid crisply fried or other coarse food, and they should, as much as possible, confine themselves to liquid or semi-liquid foods. A good deal of fatty food should be recommended. (6) Elderly people in particular, who have but few or no teeth, and a saliva which is insufficient in quantity and quality, must be most carefully advised as to their diet, and in such cases taka-diastase should be administered. (7) From the fact that carcinoma does not develop from the large ulcers alone, but may be developed from the very smallest, the prognosis of ulcer of the stomach is bad. Our aim, therefore, should be to prevent the formation of ulcers rather than to heal them after they are formed, and this may be done, at least to a certain extent, by the energetic treatment of all cases of chlorosis and secondary anemia that come under our observation. (8) After reviewing the literature, we are now in a position to say that no one before us has laid stress on the fact that carcinoma of the stomach, which develops from an ulcer, originates from certain parts of their edges, and that this, while of importance in itself, will prove to be of great value when it is sufficiently considered in reference to the etiology of carcinoma in general."

In discussing some **problems relating to the surgery of the stomach**, William J. Mayo¹ mentions four important lines of inquiry which are to be pursued in the diagnosis of gastric lesions: The history of the patient, the size and position of the stomach, tumor or localized pain or tenderness, and interference with the progress of food. The mechanics of the stomach is a most interesting consideration to the surgeon. Mayo refers to the difficulty frequently met in distinguishing a gastric ulcer from a carcinoma, and calls attention to the fact that the two conditions may be associated. The author has made some endeavor to estimate the normal caliber of the pylorus, and states that when a normal pyloric opening is compressed between the thumb and finger, invaginated into the stomach

¹ Boston M. and S. Jour., May 1, 1902.

and duodenal walls on either side, the lumen will permit of easy meeting of the opposing digits and indicates an opening about the size of a silver 3-cent piece. Many cases of chronic dilation of the stomach accompanied by symptoms, upon careful surgical exploration show no cause for the condition. A condition which the author has often met, and which is frequently the cause of gastric distention, is an angulated pylorus. The most perplexing cases are those of gastropptosis in neurotic patients, and Mayo classes them with cases of movable kidneys. When dilation is accompanied with retardation of the passage of food from the stomach, operation should be considered. William J. Mayo and his brother have performed pyloroplasty 15 times; in 4 of these patients a secondary gastroenterostomy was necessary in order to relieve the symptoms permanently. The failure of the operation in these cases to relieve the symptoms was due to the fact that the degenerated muscle-fiber of the stomach-wall was unable to elevate the food from the gastric pouch to the high-lying pylorus. On 5 occasions attempts have been made to anchor the pylorus in a lower position. Gastroenterostomy has been performed 80 times with 8 deaths. For cancer, 21 times with 4 deaths, the greatest duration of life after operation being 19 months. In this case the patient was able to do manual labor for more than 16 months. In the majority of cases of gastric cancer Mayo states that gastroenterostomy results in such brief prolongation of life that it is a question whether the operation is justifiable. The hope of the future lies in early exploration and extirpation of the growth. For benign conditions gastroenterostomy is preferred to pyloroplasty. This operation frequently fails because the intestine is anastomosed too high upon the anterior wall of the stomach. Great stress is laid upon the fact that the ileum should be attached to the stomach at the lowest point of the pouch and as near the omental attachment as possible. In 3 cases in which gastroenterostomy was done a second operation was necessary because of angulation at the site of anastomosis. This occurred some weeks or months after operation, and was due to a contraction at the anastomotic opening. This contraction, however, takes place only when there is an unobstructed pyloric opening, and only demonstrates nature's effort to close an unnecessary fistula. The symptoms indicating a contraction of the anastomotic opening are attacks of burning pain in the stomach with nausea and perhaps the regurgitation of a little bile-stained fluid. Enteroanastomosis is indicated for the relief of the condition. Mayo suggests that in cases in which the pylorus is unobstructed it would be wise at the primary operation to make an enteroanastomosis. In performing gastroenterostomy Mayo uses the Murphy button. When the anastomosis is made low down at the point indicated, he believes that the anterior operation will be found as satisfactory as the posterior. The attachment of the ileum to the lowest portion of the stomach does much to obviate the future possibility of a vicious circle. Mayo reports 2 cases of gastroenterostomy in which the bowel became detached from the stomach once on the seventh day and once on the tenth day, with resulting leakage and death. In each case the point of separation occurred at the superior edge of the union. In order to avoid this accident in recent cases,

Mayo has reinforced the anastomosis by bringing up the omentum and attaching it along the superior border of the anastomosis.

H. Hale White¹ delivered an interesting clinical lecture on the symptoms and treatment of **perigastric adhesions**. A more careful study of the symptoms of this condition is urged, in order that an earlier diagnosis may be made and proper treatment instituted. He does not believe that we ought to depend to such great extent upon exploratory operation in order to make a diagnosis, but shows that with some care and study perigastric adhesions may be diagnosticated in most instances. Gall-stones are not an infrequent cause of adhesions about the pyloric end of the stomach, causing abdominal pain and gastric dilation. White, however, calls particular attention to adhesions due to gastric ulcer, which are by no means uncommon, since in the postmortem room about 45 % of the cases of gastric ulcer show more or less adhesion to neighboring organs. The author quotes Fenwick's table of 123 cases, which shows the pancreas and liver to be the organs most frequently involved in the adhesions. Adhesion to the pancreas frequently saves the patient from the danger of perforation. During 9 months 8 cases in which a diagnosis of perigastric adhesions was made have been met, 3 of the patients refusing operations and disappearing from observation and the remaining 5 submitting to operation. The diagnosis was confirmed in those patients who submitted to operation, and this series of 5 cases is made the basis of White's remarks. In all the patients severe pain was the prominent symptom, and in 2 required large amounts of morphin. Pain is usually situated at the upper part of the abdomen, and when the history shows that it has lasted for years, it is of the utmost diagnostic value; it is likely to be of a paroxysmal character, although some pain is nearly always present. Carcinoma is the only other condition which is likely to produce prolonged and constant pain with acute exacerbations. In cases of perigastric adhesions little or no flesh is lost, the condition seldom produces death, and occurs usually in young people. In none of his patients did White find that the taking of food increased the pain. The paroxysmal character of the pain is supposed to be due to peristalsis, which produces a dragging upon the adhesions. It is thought that many cases of "gastralgia," "hysteria," or "hypochondriasis," if carefully investigated, will be found to be due to intra-abdominal adhesions. Local tenderness is sometimes elicited, but more rarely still the matting together of the organs can be elicited by palpation; dilation of the stomach is often present, but, unlike that due to ulcer, there will be few symptoms of indigestion; severe pain, in fact, is the most prominent symptom. It must, of course, be remembered that perigastric adhesions and an unhealed gastric ulcer may be associated. When the symptoms are due to the adhesions, the pain is likely to be constant and of long duration, occurs when the stomach is empty more than when it is full, and is not increased or produced by the taking of food. The situation of the adhesions will also influence the symptoms; for instance, if a band passes from the stomach to the colon, the contraction of either of these organs will produce severe pain, while if a large area of the

¹ Lancet, Nov. 30, 1901.

stomach is fixed to the pancreas, it is not likely that the pain will be severe. Of course, the history of an old gastric ulcer will be of the greatest value. In speaking of the treatment the author shows the uselessness of employing any other than surgical means for the relief of the condition; medicines are futile, but the surgeon may divide or completely remove the adhesions. It is very important for the surgeon to bear in mind that there may be 2 ulcers, and therefore 2 sets of adhesions in the same case. In cases of gastric ulcer in which the symptoms of adhesions are also present, it is a mistake to attempt the cure by rectal feeding, since the patient is sure to become worse under such treatment. A brief history of the 5 cases referred to completes the lecture. [The foregoing remarks are those of a medical man, which fact adds importance to what is said regarding the necessity of surgical treatment.]

Keetley¹ presents 4 cases of **ulceration of the esophagus and stomach** due to the swallowing of strong **hydrochloric acid**. The first patient came for treatment 8 months after swallowing the acid. This patient suffered from an enormous dilation of the stomach. In this case Loreta's method of pyloric dilation was very successful. In the second case the patient suffered from collapse soon after the abdomen was opened, and no radical operation was performed; death occurred subsequently from pneumonia, and postmortem examination revealed contraction of the pylorus. In the third case, occurring in a woman aged 46, the operation was performed 6 weeks after the swallowing of hydrochloric acid with suicidal intent. This patient was suffering from a marked stricture and progressive ulceration of the esophagus and pyloric end of the stomach. Gastroenterostomy by means of the Murphy button gave immediate relief, but the patient died 6 weeks later from pneumonia. Postmortem examination disclosed the Murphy button in the stomach and showed that the ulceration of the esophagus was unhealed. Keetley expresses the opinion that ulceration of the esophagus and pharynx leads to a secondary infection of the lungs either through the lymphatics or through the trachea. In subsequent cases Keetley has determined to pursue the following treatment: the administration of no food whatever by the mouth for a number of weeks, in fact, until there is good reason to believe that the ulceration has healed. Since the pyloric portion of the stomach is the usual seat of the ulceration, operation should be performed early. At this time two tubes should be introduced, one into the stomach and one passing through into the anastomosed intestine; through the one the stomach may be irrigated, and through the other the patient can be fed. The after-treatment is of the greatest importance.

C. G. Cumston² presents a general study of the **etiology, pathology, and treatment of bilocular stomach**, and reports 2 cases which he has treated. The condition may either be congenital or acquired. Curious theories have been suggested to account for the congenital condition, from a want of development to an abscess of the stomach during fetal life. A case of the latter condition has been reported by Goodhart. Among the causes of acquired bilocular stomach are gastric ulcer, pressure with

¹ *Lancet*, Nov. 16, 1901.

² *Med. News*, Dec. 7, 1901.

ulceration, erosion of the gastric mucous membrane from the ingestion of acids and alkalis, syphilitic lesions of the stomach, and malignant disease. At the time of operation the congenital form may be differentiated from the acquired by the fact that it is usually free from adhesions with the neighboring organs and that the stricture is longer and not formed of cicatricial tissue. Its cardiac portion also is usually larger than the pyloric. Attention is called to the fact that gastric ulcer may be met in congenital bilocular stomach and may be situated at the site of constriction. The cardiac portion of a bilocular stomach often presents considerable thickening of its muscular coat, due to hypertrophy from overwork. The lumen of the channel connecting the two portions has varied in the reported cases from a size sufficient to admit a lead-pencil to one sufficient to admit the passage of 4 fingers. The cardiac pouch is not infrequently found to be dilated. Adhesion to surrounding structures is frequently met, and is usually the result of cicatrization following ulcer of the stomach. When the opening between the two portions of the stomach is sufficiently large to allow the free passage of food, the patient may never suffer from symptoms. A congenital hour-glass stomach predisposes to gastric ulceration at the site of constriction. The symptoms of bilocular stomach may be divided into 2 groups: those indicative of gastric ulceration, and those which may truly be said to be due to the hour-glass constriction of the organ. The latter symptoms closely resemble those of pyloric obstruction: the stomach-contents are retained, particularly the solid portion, not being able to make their way through the constriction into the pyloric portion; vomiting is a constant symptom, and not infrequently the vomitus contains food which has been taken several days previously; offensive eructations, the result of decomposition of the food, occur; the appetite usually remains good and liquid diet will often do away with the symptoms. The vomiting of blood may occur at this stage, although it may not have occurred for years. As the condition advances pain becomes a prominent symptom, accompanied by emaciation. These late symptoms lead the surgeon not infrequently to make an erroneous diagnosis of gastric cancer. A feeling of fulness in the stomach, even after the ingestion of a small quantity of food, is considered an important symptom. A correct diagnosis is difficult, but in many cases it can be made. Occasionally, even when the stomach has been opened, the condition has not been recognized. This is particularly true when the cardiac pouch is small. [A case illustrating this remark will be found in the YEAR-BOOK for 1902, page 89.] When the abdominal wall is thin and the stenosis not sufficiently tight to prevent the passage of gas and fluids through it, the condition may frequently be recognized by distending the stomach. At times a tumor can be palpated, and more rarely a resonant area will be discovered on both sides of such a mass. A splashing sound obtained after the stomach has been apparently emptied by means of a tube is an important sign, indicating that the cardiac pouch has been emptied by the tube and that the pyloric pouch still contains fluid. The fact, too, that only a small portion of the water which has been introduced into the stomach returns would tend to confirm the diag-

nosis of bilocular stomach. The x-ray has also been employed as a diagnostic measure. The examination of the gastric contents shows an entire absence of free hydrochloric acid or only traces of it. The absence of free hydrochloric acid and the presence of the acids of fermentation is accounted for by the presence of chronic gastritis. A differential diagnosis between stenosis of the duodenum and hour-glass stomach should be made. If the former condition exists, bile and pancreatic juice can be demonstrated in the gastric contents. As the stenosis increases in bilocular stomach, torsion on its axis is apt to take place, producing death. Operation is urged when the symptoms already detailed present themselves. The operations employed in this condition are: resection of the stricture with suture of the two pouches; a plastic operation such as the Heineke-Mikulicz operation for stenosis of the pylorus; gastrogastrostomy; gastrojejunostomy and gastroduodenostomy; and gastrolisis. Digital dilation after the method of Loreta should not be recommended. "No operation can be decided upon before the abdomen has been opened and the condition of affairs thoroughly ascertained, and it is only after the surgeon has become perfectly familiar with the anatomic conditions present that he may select the operation the most applicable under the given circumstances." Excision of the stricture followed by gastrorrhaphy could be applicable only in rare cases. The Heineke-Mikulicz method should not be employed if the cicatrix is very extensive or if a large portion of the mucosa is ulcerated. When these conditions, however, do not exist, this operation is extremely gratifying. The most generally applicable and satisfactory method of operation is gastroanastomosis, and this is strongly recommended by Cumston. It can be more rapidly performed than most of the operations suggested for the cure of the condition and is more advantageous than gastroenterostomy because it re-establishes stomachal digestion in its entirety. This operation, however, cannot be performed when the pyloric pouch is very small. Under such circumstances gastroenterostomy should be resorted to. In the first case reported, that of a woman aged 49, Cumston performed gastrojejunostomy; this patient made a slow but satisfactory recovery. In his second case, that of a woman aged 47, a plastic operation was done by the Heineke-Mikulicz method; this patient made a prompt and very satisfactory recovery.

A case of **perforating gastric ulcer with hour-glass contraction of the stomach** is reported by Brown.¹ Perforation, when hour-glass contraction has resulted from cicatricial contraction, is rare. The patient was a woman 49 years of age. When seen by Brown, a diagnosis of perforation was easily made, but the patient was dying. The postmortem examination revealed marked hour-glass contraction of the stomach, the viscus being divided into two nearly equal cavities connected by an aperture which admitted the little finger. Crossing bundles of muscular fibers were very distinct upon both the anterior and posterior surfaces at the contraction. The perforated ulcer measured $\frac{1}{4}$ of an inch in diameter.

A most unusual case of **bilocular stomach with extreme distention**

¹ Lancet, Sept. 14, 1901.

of the cardiac portion is reported by Bouveret.¹ The patient was a woman aged 45 who had suffered from symptoms of indigestion for 15 years, and for 2½ years had noticed a tumor in the right flank which had gradually enlarged. Examination demonstrated that this tumor extended from the thorax to the iliac crest. It was dull upon percussion and apparently contained fluid. Respiration was difficult and the heart's action was rapid, evidently because of compression. The diagnosis of hydatid cyst of the spleen was made and the tumor was tapped. Examination of the fluid withdrawn showed that it came from the stomach. After the puncture the patient rapidly improved. The tumor, however, reappeared a month later and assumed its former proportions. On this occasion the use of the stomach-tube relieved the symptoms. A diagnosis of pyloric obstruction was made, but the patient declined operation. Some time later she was readmitted to the hospital in a dying condition, and the postmortem examination revealed a bilocular stomach with great distention of the cardiac portion. The lesson which the author draws from this case is that the stomach-tube should be employed for diagnostic purposes in all cases of supposed cystic condition of the upper part of the abdomen.

Elder² reports an interesting case of **hour-glass stomach**. The patient was a woman aged 41. She had undergone treatment for ulcer of

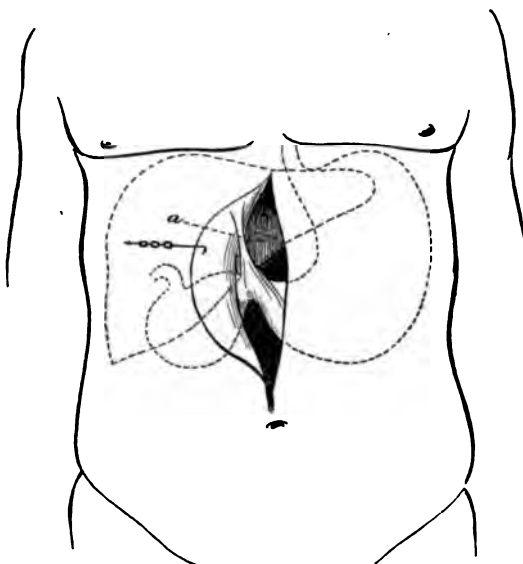


Fig. 15.—Elder's case of hour-glass stomach (*Ann. of Surg.*, May, 1902).

the stomach 14 years previous to admission; 2 years after her first attack the trouble recurred, but was not so severe. Upon admission she complained of vomiting after the taking of any solid food, was rapidly emaciating, and weighed only 98 pounds. Examination showed a moderately dilated stomach with a well-defined tumor in the epigastrium, freely movable and not very tender. After a week's rest in bed the tumor disappeared and the patient became a great deal better. Operation was, however, decided upon. The condition found is well shown in the accompanying illustration, and closely resembles the case reported by Child. [See YEAR-BOOK, 1902, page 89.] The band shown in the illustration, which passed from the constriction to the abdominal wall, was found to be a diverticulum, probably the result of stretching an old adhesion to

¹ *Lyon Méd.*, Mar. 16, 1902.

² *Ann. of Surg.*, May, 1902.

the abdominal wall. A gastropasty was performed by the Heineke-Mikulicz method with a very satisfactory result.

R. J. Pye-Smith¹ reports 4 cases of **perforated gastric ulcer** and discusses the diagnosis, prognosis, and treatment of the condition. The discussion of the subject is based upon a table of 10 cases with which the author is familiar. In 3 of these exploratory operation was performed for suspected ulcer, but none was found; in 1 no operation was done, the patient dying 24 hours after the onset of symptoms. A diagnosis may be arrived at by the suddenness and severity of the onset of symptoms without the history of external injury. The site of the pain and tenderness suggest the stomach, duodenum, or gall-bladder as the seat of the trouble. A history of dyspepsia and vomiting, or retching, if present, would indicate the stomach rather than the gall-bladder, as does also the youth of the patient. The severity of the pain indicates extravasation. Collapse is sudden and is followed by vomiting or retching. This in turn is followed by marked epigastric tenderness and rigidity, together with thoracic respiration. Until a diagnosis is made no morphin or other sedative should be employed. In all of the 10 cases recorded the patients were young unmarried women, and in each a history of painful dyspepsia was obtained, and in more than half of the cases the dyspepsia was accompanied by more or less frequent vomiting. Hematemesis occurred in but 2 of the proved cases and in 1 of the others. Two of the proved cases had suffered a previous attack. It must be remembered that symptoms may be altogether latent and no history of dyspepsia obtainable. In most instances there was a history of muscular exertion as the exciting cause of the perforation, and in nearly every instance a solid meal had been taken a few hours before perforation had occurred. Vomiting after perforation occurred in about half the undoubted cases and in the same proportion of the others. Vomiting does not disprove perforation, as oftentimes the perforation is not sufficiently large to empty the stomach. Liver dulness was lost in all but one case. Its disappearance in the unproved cases is explained on the hypothesis that relaxation of the diaphragm permits the contracted abdominal muscles to push the liver up. Pye-Smith considers pain, tenderness, and rigidity over the stomach and in the left hypochondriac region the most important diagnostic signs. After the first shock reaction generally set in, and in all the proved cases collapse soon returned and deepened. In most cases the temperature was normal or subnormal at first and then rose before operation. The author is unable to account for the symptoms presented by the cases in which no perforation was found. The symptoms in each of these seemed quite sufficient to warrant operation, and the author's only explanation is that possibly the ulcer existed, although not found at the operation, and that the careful after-treatment resulted in its healing, each patient having recovered. All the patients were operated upon under general anesthesia. In 2 of the fatal cases operation was undertaken late and the patients' condition was bad. Of the 2 successful cases in the table, both were reported well a year and 3 months after operation. The ulcer in each case

¹ Quarterly Med. Jour., Nov., 1901.

was situated in the anterior wall of the stomach; in 3 it was so near the cardiac end that it could not be drawn out of the abdomen for the purpose of suturing. Gastric ulcer is found most frequently on the posterior surface, but perforation occurs most frequently when the ulcer is on the anterior wall. Sponging and irrigation followed by drainage were employed in each case. The after-treatment consists largely in rectal feeding and keeping the stomach at rest. Prognosis may be determined on the following facts: "(1) The condition of the patient immediately before operation, especially as indicated by the pulse, and (2) the efficiency of the operation, especially with respect to the degree of thoroughness with which the cleansing of the peritoneum is carried out. Then, as influencing the above factors, may be placed, in order of importance, (3) the length of time intervening between perforation and operation, (4) the quantity and quality of food and other ingesta taken into the stomach after perforation and during some hours preceding it, (5) the amount and situation of intra-peritoneal extravasation, and (6) the amount of disturbance of the body produced by transportation, vomiting, etc."

In discussing the **surgery of nonmalignant gastric ulcer and perforation**, C. B. Keetley¹ reports 22 cases of gastric operations. The author maintains that an absolute diagnosis of gastric perforation is impossible, and also that it is unnecessary. A few well-defined symptoms are sufficient to show that an exploratory operation is indicated. Two of the cases reported illustrate the fallacy of waiting until there is no doubt regarding the diagnosis. When in doubt, it is better to explore. A surgical consultant should be called early in cases of suspected gastric perforation. Sudden and severe abdominal pain, accompanied by faintness, with or without vomiting, are suggestive symptoms; and more than suggestive when the patient is anemic and gives a history of chronic indigestion. Absolutely no food should be given by the mouth in doubtful cases; however, when the Murphy button is employed in doing gastroenterostomy, liquid food may be allowed by the mouth soon after operation if the patient's condition demands immediate nourishment. It is the author's custom to stop the anesthetic the moment the stomach has been withdrawn from the abdomen. He rarely uses opium, as it masks symptoms. As is illustrated by two of Keetley's cases, even when patients escape immediate danger after a perforating gastric ulcer a subphrenic abscess may develop which is apt to result in a long and dangerous period of chronic invalidism. The author thinks it inadvisable to approximate closely the mucous membrane of the stomach by a separate close suture, as abscess-formation between the layers may occur and drainage into the gastrointestinal canal is impossible. Keetley is a strong advocate of the Murphy button, and describes minutely the technic of its introduction. He also makes a brief report of each case in the series.

E. Collingwood Andrews² presents a report of two cases of **perforated gastric ulcer** in which recovery followed operation. In each case at the time of perforation the stomach was well filled, and it was impossible to empty the organ through the pylorus at the time of operation; therefore

¹ Lancet, April 5, 1902.

² Brit. Med. Jour., Sept. 21, 1901.

the closure of the perforation was rendered particularly difficult by the constant pouring out of the stomach-contents. It is the author's rule to irrigate the abdominal cavity if the stomach-contents have become widely diffused. If, however, the escape has been limited and moderate, he is satisfied with careful sponging. The first patient, a woman aged 23, had suffered for some months with indigestion; she had never vomited blood. The symptoms of perforation were ushered in by a collapse which took place suddenly while the patient was carrying a tray; she suffered extreme pain and the abdomen was board-like and tender. The abdomen was opened within a few hours and a perforated ulcer was found near the cardiac end of the lesser curvature; the opening was closed with two Lembert sutures and the cavity was washed out with hot saline solution. Both gauze and a drainage-tube were used, the gauze drain being removed on the second day and the drainage-tube on the third. On the fifth day there was a free action of the bowels after an oil injection, and the patient was given milk by the mouth. The patient made an uneventful recovery. The second case was that of a man 30 years of age. The symptoms in this case were also sudden and violent, and when seen by Andrews 2 hours after the first symptom, the patient was found in a collapsed condition. The abdomen was rigid and distended and liver dulness was obliterated. Immediate operation was performed and a perforation was found on the lower border of the stomach $\frac{3}{4}$ of an inch from the pyloric orifice. In this case the escape of stomach-contents was more or less limited, and for cleansing only sponging was resorted to. A combination of tubular and gauze drainage was used, as in the first case. The patient was fed by the rectum for 7 days, the gauze drain being removed on the second, and the tube on the sixth, day. Except for a phlebitis of the right lower extremity, the patient made an uneventful recovery.

Lucy and Whipple¹ report 2 cases of **perforating gastric ulcers occurring in sisters**. Both patients were operated upon and both recovered. In each case the ulcer was close to the lesser curvature near the cardiac end. In both cases perforation took place $3\frac{1}{2}$ hours after the ingestion of food. In the first case the operation was not performed until 26 hours after the perforation and the patient was in a very bad condition. In this case free gas was present in the peritoneal cavity and there was a diminution of liver dulness. The second case was operated upon 5 hours after the perforation; no free gas was present in the peritoneal cavity and there was no diminution of liver dulness. The second case is particularly interesting because of the age of the patient, who was only 16 years.

A case of **perforated gastric ulcer which closely resembled appendicitis** is reported by Horsford.² The patient was suddenly seized with an attack of acute pain in the abdomen accompanied by vomiting, a normal temperature, and tenderness over the gall-bladder. The acuteness of the pain subsided somewhat and the patient seemed to improve until 3 days later, when she had another attack of severe pain with tenderness and bulging in the right iliac fossa; no operation was done and the patient

¹ Lancet, Feb. 15, 1902.

² Lancet, Feb. 15, 1902.

died 2 days later. Necropsy revealed an abscess in the midst of a mass of intestine, a perforated gastric ulcer upon the anterior wall of the stomach, and a normal appendix.

Codman¹ reports a case of **perforation of a malignant ulcer of the pylorus** occurring in a man of 51, the symptoms of which closely resembled those of appendicitis. The case is interesting not only because of the symptoms, but also because of the rarity of perforation of the stomach from malignant disease.

Three interesting cases of **perforated gastric ulcer** are described by R. A. Stirling,² of Melbourne. The first patient was operated upon 15 hours after the onset of symptoms and immediately upon her arrival at the hospital. In this case the patient was suffering from marked symptoms of peritonitis and the abdomen was found full of turbid seropurulent fluid. The perforation was discovered at the pyloric end near the gastro-hepatic omentum. The edges of the ulcer were too friable to hold the sutures, so they were freely excised and the opening was closed by a single layer of Lembert sutures. An incision was then made below the umbilicus, and the pelvis and lower abdomen were thoroughly cleansed by irrigation with salt solution. Especial care was given to the subphrenic area. A gauze drain was inserted at the site of the perforation and another into Douglas' pouch. This patient made a rapid convalescence. The second patient was operated on immediately upon her arrival at the hospital, 13 hours after the onset of symptoms. The patient was in extremely bad condition and died upon the table. In another such case Stirling states that he will employ local in preference to general anesthesia, and will simply incise, irrigate, and drain at the site of perforation, as he believes that it was the effect of the anesthetic, added to the girl's serious condition, which produced the death. The third case was very much like the first and the same operative technic was employed. This patient subsequently developed 2 subphrenic abscesses which required opening and drainage. The patient died suddenly 2½ months after operation. Death was the result of an abscess at the apex of the left lung which ruptured into a bronchus.

Priestley Leech³ reports 2 cases of **supposed perforated gastric ulcer** in which laparotomy was performed but no ulcer found. In both cases the symptoms were quite characteristic, there being collapse, subnormal temperature, sudden gastric pain and tenderness with rigidity of the abdominal wall. In comparing these cases with others in which ulcer was met, the only difference noticed is that in these two cases the pain was not so intense nor the rigidity of the abdomen so marked as in cases in which perforation was found. The first patient recovered promptly from the operation and had no further trouble. The second patient, however, made a slow recovery. In the two cases recorded the patients had been treated for some time for gastric ulcer.

After a discussion of the **indications for operation in gastric ulcer**,

¹ Boston M. and S. Jour., Feb. 27, 1902.

² Intercol. Med. Jour. of Australasia, May 20, 1902.

³ Quarterly Med. Jour., Feb., 1902.

Arthur T. Cabot¹ reaches the following conclusions: "(1) Acute hemorrhages should rarely be treated by operation; the results of interference have not been good, while the results of medicinal treatment have been satisfactory. When, however, a hemorrhage frequently repeats itself, even if severe in amount, it will demand operative treatment as soon as its recurrent character is plain. (2) Small, frequent hemorrhages, threatening anemia, give a clear indication for operation. (3) Perforation of the stomach, either acute with general peritonitis, or chronic with surrounding adhesions and perigastritis, demands instant operation. (4) When an ulcer runs a chronic course with a strong tendency to recurrence, and gradually diminishes the patient's capacity for work and for the enjoyment of life, an operation is indicated, especially when the patient is so situated as to be dependent on his daily work for support and unable to regulate his diet closely."

The **surgical treatment of gastric ulcer** is considered by John B. Murphy.² He approves MacDonald's indications for operation in gastric conditions, which are as follows: (1) A chronic gastritis which is progressive in character under proper dietetic, physical, and medicinal treatment; (2) loss of gastric motility; (3) progressive diminution of gastric peristalsis; (4) diminution of free hydrochloric acid, progressive in character; (5) emaciation of patient under forced diet; (6) reduction of hemoglobin in blood progressively to 65 % or under, and a moderate leukocytosis. A low percentage of hemoglobin is a positive contraindication to operation. Only about one-fifth of the cases which present symptoms of malignant disease are amenable to surgical treatment when recognized. In discussing the operations for gastric carcinoma Murphy says that gastrostomy should be limited to annular carcinomatous stricture of the esophagus when constitutional symptoms are not pronounced. As a "last resort" this operation has no place in surgery. The operation of Frank is preferred to that of Witzel. The results obtained by various operators in the performance of pylorotomy and partial gastrectomy are given. MacDonald has found 43 cases in literature in which the patient survived the 3-year period. Murphy says that the condition of the patient after resection is much better than after gastroenterostomy even though the cure may not be permanent. Gastroenterostomy should be confined to cases of stenosis of the pylorus with dilation and accumulation emesis, where it is impracticable to do pylorotomy or gastrectomy. Coley gives the mortality of this operation in gastric cancer as 36.4 % and states that the average duration of life after the operation is from 4 to 6 months. In permanent gastroenterostomy the suggestion of Mayo to attach the bowel to the most dependent portion of the stomach is highly commended. Total gastrectomy should be performed only when it is practically certain that all of the diseased tissue can be removed. When there is a high-grade stenosis and the stomach cannot be removed nor gastroenterostomy performed, jejunostomy may be resorted to in order to prevent starvation. It is regrettable that we have no estimate based on observations as to the time of appearance of metastases in gastric cancer.

¹ Boston M. and S. Jour., Aug. 29, 1901.

² Chicago Med. Recorder, June 15, 1902.

An interesting case of death from **hemorrhage from a duodenal ulcer** 8 days after an operation performed for **perforating gastric ulcer** is reported by W. J. Collins.¹ The necropsy showed an ulcer of the duodenum a half-inch from the pylorus, about the size of a five-shilling piece, with undetermined edges and very deep. The site of the repaired ulcer of the stomach was water-tight.

J. Rutherford Morison² presents the **after-progress of 5 cases of partial gastrectomy** for cancer of the pylorus. The first patient was a woman, 40 years of age. The tumor was about the size of a tangerine orange. Pylorectomy was done on October 31, 1897. The patient was perfectly well until May, 1900, performing all her usual household duties. She gained considerable weight during this period. On the 24th of May, however, the abdomen had to be reopened because of gastric symptoms. The recurrence of the tumor extended along the lesser curvature of the stomach from the pyloric end nearly to the esophagus, and along the greater curvature to within 4 inches of the esophagus. A number of enlarged glands were found in the lesser omentum and the tumor was adherent to the liver; the growth was not removable, so the abdomen was closed. The patient died December, 1900, 3 years and 2 months after her first operation. The second patient, a man 48 years of age, submitted to the operation of pylorectomy on September 12, 1898. Two months after the operation he returned to work, and remained perfectly well until February, 1900, when he did not feel quite so well, and had lost some weight. At this time a small mass was found in the scar of the abdominal wound. A large mass was found in the epigastrium firmly adherent to the abdominal wall, in August, 1900. In November, 1900, the patient died, 2 years and 2 months after the operation. An autopsy was held and there was no sign of growth in the stomach itself. The glands about the suture line, although quite easily separated from the stomach, were large and infiltrated with cancer, and the liver was studded throughout with large masses of cancer. The third patient was a woman aged 41. Pylorectomy was performed September 19, 1898. She improved greatly and took on considerable flesh subsequent to the operation, and was able to work and maintain her family until the following May, when stomach symptoms returned. A large mass was found in the epigastrium in July, and the patient died in December, 1899, 1 year and 3 months after operation; there was no necropsy. The fourth patient, a man 38 years of age, had pylorectomy performed on October 18, 1898. Two years later he reported that he was perfectly well and had gained considerable flesh, but in July, 1900, he returned with signs of extensive local recurrence. There were evidently deposits in the liver. He died 2 years and 11 months after operation. There was no necropsy. The fifth patient, a man 41 years of age, upon whom pylorectomy was performed February 9, 1899, died 6 months later of recurrence. There was no necropsy.

Moynihan,³ in a paper read before the Clinical Society of London, deals with the **operative treatment of cancer of the pyloric portion of the stomach**. It is the author's custom to recommend early exploratory

¹ Lancet, Feb. 8, 1902. ² Lancet, Jan. 11, 1902. ³ Lancet, Nov. 16, 1901.

incision in all cases where cancer is suspected. By adhering to this rule he has been able to operate upon a number of cases in the early stage of the disease. The improvement following gastroenterostomy is great and immediate, but is quite ephemeral. Partial gastrectomy and pylorotomy are much preferable to gastroenterostomy.

The **indications for operation in malignant neoplasms of the stomach** are presented by Charles G. Cumston.¹ When there are distinct appreciable changes in the gastric juice, and particularly the absence of pepsin and the presence of lactic acid after a test-meal, and when it is impossible rapidly to increase and maintain the body-weight at a normal standard by a well-conducted medicinal treatment, an exploratory operation is indicated. There is little diagnostic value in palpation under ether, and this practice is condemned as fallacious. In every case where carcinoma of the stomach is suspected an immediate exploratory operation should be done, and every neoplasm that can be removed should be excised regardless of its nature. The contraindications to resection of the growth are a feeble condition of the patient, the presence of visceral metastases, extensive growth, age of the patient, enlarged glands, etc.

Fenton B. Turck² discusses at length the **immediate and remote causes of death in operations on the stomach**, and suggests the treatment before, during, and after operation. The point upon which greatest stress is laid is preparation of the patient before operation. To the neglect of this are due many deaths. The patient should become accustomed to the use of the stomach-tube, since gastric lavage immediately before and after operation is indispensable in most cases.

Herman Mynter³ reports a case of **gastrostomy for the removal of a watch** from the stomach. The patient was a young man who had swallowed the watch accidentally. The watch measured $1\frac{1}{2}$ inches in diameter, 2 inches through the stem, and $\frac{1}{2}$ inch in thickness. The patient made a satisfactory recovery.

Tuffier⁴ reports a case of **gastrostomy for the removal of a fork** which measured between 8 and 9 inches in length, and which had remained in the stomach of the patient without causing any troublesome symptoms for 78 days. It is held that the mortality of gastrostomy for the removal of foreign bodies—which, according to recent statistics, is stated to be about 20%—may be reduced in future by early diagnosis and immediate operative treatment.

A **new method of performing gastrostomy** is described by Depage.⁵ This operation consists in the fixation of a considerable portion of the stomach to the parietal peritoneum at the edges of the incision. A long tongue-shaped flap with the attached portion upward is then taken from the whole thickness of the exposed portion of the anterior wall of the stomach. The flap is then turned upward and the wound in the stomach closed by two rows of sutures, one row in the mucous membrane and the other in the

¹ Boston M. and S. Jour., Sept. 5, 1901.

² Chicago Med. Recorder, June 15, 1902.

³ Amer. Med., May 10, 1902.

⁴ Bull. et Mém. de la Soc. de Chir., No. 36, 1901.

⁵ Jour. de Chir. et Ann. de la Soc. Belge de Chir., No. 11, 1901.

serous coat. These sutures are carried up along the corresponding tissues of the upturned flap in such a manner as to convert it into a tube. The tube thus formed is then fixed to the upper angle of the abdominal incision and a drainage-tube inserted into the stomach.

Terrier and Gossett¹ describe a **method of performing gastrostomy** which they have employed in 8 cases. The object of the operation which they describe is that of giving to the artificial opening a sphincteric action. In the 8 cases operated upon there was an absence of leakage from the fistula, except in 2 cases; in one of these failure occurred from faulty technic, and in the other the leakage was only temporary. The abdomen is opened through the left rectus muscle with as much preservation of the blood-vessels and nerves upon the posterior sheath of the rectus as possible. The highest possible point of the stomach is then drawn through the muscle by means of forceps, and the organ fixed to the abdominal wall by 3 layers of sutures, the first attaching the stomach to the posterior sheath of the rectus, the second to the anterior sheath, and the third to the skin. After the stomach is attached to the anterior sheath an incision is made through the serous and muscular layers at the apex of the cone. This results in a retraction of these layers and protrusion of the mucous membrane. The retracted serous and muscular layers are sutured to the skin and the mucous membrane then opened. The greatest stress is laid upon the importance of withdrawing a sufficiently large cone of stomach through the muscle. It is claimed for this operation that a double sphincteric action is obtained, that of the rectus muscle and that of the muscular coat of the stomach. When the operation is complete, it results in an ectropion of the mucous membrane.

Cordier² describes the **postmortem findings** in a patient upon whom **gastrojejunostomy** had been performed 6 years previously. The operation was done for benign obstruction of the pylorus. The anastomosis was accomplished by means of the Murphy button, the bowel being attached near the pyloric extremity on the anterior surface. Before operation the patient was in wretched health, addicted to the use of morphin, and weighed 115 pounds. After operation his health was entirely restored and his weight increased to 180 pounds. He returned to work, used no more morphin, and was in perfect health 6½ years after operation. At this time, however, he developed an acute pneumonia, from which he died. Autopsy revealed complete occlusion of the pylorus and a free opening at the site of anastomosis. The bowel between the pylorus and the anastomosis was somewhat atrophied. The anastomotic opening was as large as at the time of operation. Apparently there was some valve action at the opening which prevented the stomach-contents passing into the proximal portion of bowel, and also causing the bile to pass into the ileum. When the stomach was filled with water or air, none passed into the proximal portion of bowel unless the stomach and lower segment of bowel were largely distended. The remarkable feature about this case is the fact that the button, instead of passing by the bowel, dropped into the stomach and remained in this position without causing symptoms for

¹ Rev. de Chir., Feb. 10, 1902.

² Jour. Am. Med. Assoc., Mar. 1, 1902.

6½ years. One end of the button was largely destroyed, presumably by the secretions of the stomach.

Rutherford Morison¹ presents notes on the **after-history of his first 20 cases of pyloroplasty for pyloric stricture and ulcer**. Pyloroplasty, Morison says, has been the most satisfactory operation in his experience in abdominal surgery. The earliest case in the series was operated upon 6 years and 8 months previously, and the last 2 years ago. Of the 20 patients, 14 are in good health and take ordinary food; one cannot be found, but was well when last heard from; two are dead; three, though much improved, still have occasional stomach trouble. One of the deaths occurred 6 months after operation. It was due to cancer of the stomach, commencing at the site of operation. In this case a malignant tumor had been mistaken for a fibrous stricture of the pylorus. The second death in the series occurred from phthisis pulmonalis 2 years and 3 months after the pyloroplasty. During all this time the patient was free from stomach symptoms. In none of the cases was there a return of the symptoms due to pyloric stricture. These results cause Morison to think that pyloroplasty is preferable to gastroenterostomy except in cases in which the pylorus is so bound down or involved in adhesions as to be inaccessible.

DISEASES OF THE PERITONEUM AND INTESTINES.

Bottomley² presents a consideration of 28 cases of **tuberculosis peritonitis** occurring in the Boston City Hospital with **particular reference to the results of operative treatment**. In collecting this series of cases the author has been careful to exclude all cases in which the clinical diagnosis was not confirmed by the microscope, by the tuberculin test, or by autopsy, and also to report as recoveries only such patients as were seen or heard from not earlier than 1 year after operation. Of 1170 autopsies at the Boston City Hospital from 1895 to 1900, tuberculosis was present in some form 197 times; and in 14 of these cases the peritoneum was affected. In comparing this statement with that of Borschke, it is shown that the peritoneum was involved about half as frequently as in the Breslau cases. Primary tuberculosis of the peritoneum is very uncommon. It was present in none of the Boston City Hospital cases. Bottomley quotes the literature on this point extensively. The disease is, according to most reporters, more common in women than in men. In the present series, however, the sexes are equally divided. The disease is most frequent between the ages of 20 and 40. Examination of the chest showed probable tuberculous affection of the lungs in 9 of the patients and was said to have been negative in 11; in 8, no examination was recorded. Of the 9 cases in which the lungs were said to have been affected, 4 of the patients died; autopsy disclosed lung affection in two other fatal cases in which it had not previously been suspected. Of the patients that recovered, the lungs had been found negative in 7 and affected in 1; in 3 cases they were not examined. The onset may be acute or gradual. It

¹ Brit. Med. Jour., Oct. 19, 1901.

² Amer. Med., Feb. 15, 1902.

was acute in 13 of these cases, gradual in 13, and in 2 could not be classified. In 17 of the cases pain was the first symptom noticed; in 8, malaise; and in 2, distention. Pain was present during some portion of the course of the disease in 26 cases; it was entirely absent in only 2. When not the first symptom, it followed after periods varying from a few days to 6 months. It disappeared before operation in 4 of the cases. Distention was present in 23 cases, in 2 of which it was very slight. It usually came early in the course of the disease, but in 2 cases was much delayed, appearing in 1 case 1 year and 3 months, and in another 1 year and 10 months, after the onset. Abdominal tenderness, loss of flesh and strength, nausea and vomiting, and disturbance of the intestinal functions were also prominent symptoms. The cases are separated into three divisions, viz.: (1) Ascitic. This form may be either acute or chronic; the chronic cases may be either general or encysted. (2) Fibrous, which may be either dry or adhesive. (3) Ulcerative, which may be either dry or suppurative. Under these headings the present series divides itself into (1) 19 cases of the ascitic type, 10 of which are acute and 9 chronic; of the chronic cases, 6 were general and 3 encysted; (2) 7 of the fibrous type, 2 of which were dry and 5 adhesive; and (3) 2 of the ulcerative type, both of which were suppurative.

Operation, which should consist in simple incision with evacuation of the fluid and closure of the wound, does no harm even in cases where it is unsuccessful as a curative agent. This simple treatment is as successful as that in which more extensive eradication of the disease is attempted. In 3 of the present cases the appendix, and in 1 the uterine adnexa, were removed; the results, however, in these cases did not differ from those in the others, except in one case where a fecal fistula and death followed the removal of the appendix. Of the 28 cases 18 were drained; in 5 a fecal fistula followed, 4 of the patients dying and 1 recovering; in 10 of the 11 fatal cases drainage was employed. The wound was closed in 11 cases and but one patient died. None of the 28 patients died as a result of the operation. If the intestine suffers much injury, fecal fistula is apt to occur. Of the 28 patients, 4 were well between 1 and 2 years after operation; 2, between 2 and 3 years; 3, between 3 and 4 years; 1, between 4 and 5 years; and 1 over 5 years. In all the fatal cases the patients died within 4 months after the operation. The importance of early operation so far as prognosis is concerned is probably not great. The comfort of the patient, however, may demand an early operation. After a careful consideration of the cases recorded and of the literature of the subject Bottomley concludes as follows: "(1) We may reasonably expect cures (*i. e.*, one year or more after operation) to follow the operation in from 30 % to 40 % of all cases. In fatal cases the patients usually die within a few months after operation. (2) Family history does not appear to be important etiologically. Previous inflammatory affections of the abdominal viscera may have etiologic significance. (3) Operation usually affords at least temporary improvement either locally or generally even in cases that later may prove fatal. The use of drainage following the operation should be avoided when possible. (4) Inferences as to the remote

results of operation should be drawn very guardedly, if at all, from the immediate results; though in cases which do not immediately receive from an operation either local or general benefit the prognosis is very unfavorable."

The **pathology, symptomatology, and diagnosis of tuberculous peritonitis** is discussed by Eisendrath.¹ Borschke found tuberculosis of the peritoneum to exist 226 times in 1393 autopsies upon tubercular subjects. The condition is secondary to a tubercular lesion elsewhere, usually the lungs. Out of 226 cases referred to, Borschke found the disease was primary in only 2 cases. The tubercle bacilli may be carried to the peritoneum through the blood, as in a general miliary tuberculosis; by the lymph-channels, as after an extensive tuberculosis; by continuity, which is in reality also an extension by the lymphatics, and is illustrated by tuberculosis of the tubes and ovaries in the female and tuberculosis of the genitals in the male; and through the diaphragm, being secondary to a tubercular pleuritis or pericarditis. Although formerly thought to be more frequent in men than in women, the reverse is now known to be true. The condition is rare before the age of 3 and beyond 50. Kelly gives the average age in women as 27½ years. The latter also states that pregnancy is often followed by tuberculosis of the peritoneum. The disease presents itself usually in one of four forms: First, the hematogenous or disseminated miliary form, which occurs in general miliary tuberculosis and is characterized by small grayish nodules present everywhere in the peritoneum and surrounded by a hyperemic zone. Second, a local lymphogenous form, usually secondary to intestinal tuberculosis. Here, grayish or yellowish tubercles are found to follow the course of the lymph-vessels and are frequently arranged in rows on the intestines. This condition is frequently seen in the cecum in cases of tuberculous ileocecal disease. Third, the exudative form, in which the peritoneal cavity contains more or less serous, serofibrinous, or purulent exudate. This form is not infrequently seen in cases of cirrhosis of the liver. It is characterized clinically by the presence of free or sacculated ascites. Fourth, the adhesive or fibrous form, which is the slowest of all forms in development and is most frequent in children. Here fibrous adhesions form inclosing tubercles with extensive adhesion of intestinal coils to each other, to the solid viscera, and to the parietal peritoneum. The omentum is often found rolled up into a transverse coil crossing the abdomen just above the umbilical line. The intestines are contracted and their walls thickened. Between the adherent coils sacculated accumulations of fluid are found which often resemble cysts. This form in children sometimes causes infiltration of the abdominal wall resulting in abscess and rupture, which usually occurs at the umbilicus. The fifth form is described by Holt, in which enlargement of the mesenteric glands constitutes the principal symptom.

The symptoms of tuberculosis of the peritoneum are by no means always characteristic. The disease may run an acute, a subacute, or a chronic course. In the acute variety the symptoms may closely resemble

¹ Ann. of Surg., Dec., 1901.

those of a strangulated hernia or of an acute appendicitis; the subacute symptoms simulate typhoid fever; the chronic form is the most frequent. Kelly lays stress upon pain referred to the back and lower abdomen as of great diagnostic value in women. Pain on urination is also considered a valuable symptom in women by Kelly. Unless the case is very acute, vomiting does not occur, nor is diarrhea present unless the intestine is also involved in the disease. Dilation of the superficial abdominal veins is of value, particularly in children. Ascites may be either free or encapsulated. The presence of tumor-like thickenings of the omentum and of nodular masses felt between the intestines is very indicative. In some cases of the dry variety the only symptoms are colicky pains and tympanites, accompanied by gradual emaciation and progressive anemia. The presence of tuberculous pleurisy is of value in making a diagnosis of tuberculosis of the peritoneum. The transverse omental tumor, which can frequently be felt, due to the rolling up of this organ, must be differentiated from a gastric carcinoma.

The **treatment of tuberculosis of the peritoneum** was considered by Christian Fenger,¹ who presented a résumé of the entire subject of treatment. Reference is made to the varying attitudes taken by the profession toward the surgical treatment of this condition, many authors and their statistics being quoted. The surgical treatment presents a very low operative mortality of from 1 % to 2 %, but Borchgrevink has carefully studied 2 series of cases of tuberculous peritonitis, in one of which operative treatment was resorted to, in the other, only medicinal treatment, and shows conclusively that surgical treatment accomplishes practically nothing more than does the medicinal. His series represent 22 cases treated by laparotomy and 18 cases treated without laparotomy. Fenger quotes Borchgrevink's conclusions and heartily indorses them. They are as follows: "That the laparotomy, in strong patients in whom fever is absent and their condition of good nutrition speaks for a spontaneous disappearance of the tuberculous process, is well tolerated. Laparotomy, however, in patients with fever, when the tuberculosis has a progressive character, must diminish what slight power of resistance such a patient has remaining. This power of resistance may thus yield, and death follow, or it may, by concurrence of fortunate circumstances, rebound, and the patient recover in spite of the operation. That form of peritoneal tuberculosis which exists without fever, or with only slight fever, runs in itself a favorable course. In such cases laparotomy is unnecessary. In progressive tuberculosis the operation is dangerous and should be abandoned."

Gilbert Barling² reports an interesting case of **suppurative peritonitis due to pneumococcal infection and associated with empyema**. The patient was a girl 9 years of age admitted to the hospital for an acute abdominal illness. The trouble started about a month before admission with general pain, most marked in the limbs. At this time also there was a catarrhal condition of the base of the right lung. A week after the onset of the illness the patient began to suffer from intermittent attacks

¹ Ann. of Surg., Dec., 1901.

² Birmingham Med. Rev., Dec., 1901.

of severe abdominal pain accompanied by vomiting and diarrhea. At the time of admission the abdomen was distended and a dull tender mass could be demonstrated extending $2\frac{1}{2}$ inches above the symphysis. The right lung posteriorly was dull with decreased vocal resonance and diminished breath-sounds. The patient lay upon her side with the limbs flexed. The urine contained albumin and a few pus-cells. One week after admission the right pleural cavity was drained. The pus which was withdrawn was found to contain a few pneumococci. The abdominal condition did not improve, however, and 10 days after admission to the hospital the abdomen was opened and about $1\frac{1}{2}$ pints of greenish, odorless pus evacuated; the cavity was drained without irrigation. A growth of pneumococci was obtained from this fluid. A second collection of pus took place and was drained through the original incision. Three months after operation the child was in perfect health, both as to chest and abdomen. The case is said to be a fairly typical one of pneumococcal infection invading the peritoneum. Barling thinks that these pneumococcal infections of the peritoneum should be separated from other infections, especially from those arising from the appendix, and lays down the following points as indicating the pneumococcal infection: The patients are generally young, and, as a rule, of the female sex; the onset is apt to be characterized by general body and limb pain; diarrhea instead of the constipation so common in appendicitis; and no localized pain in the appendix region. The pus is usually odorless and of a greenish color. If unrelieved, the pus tends to find an escape at the umbilicus. The treatment should consist in evacuation, irrigation, and drainage.

Fontaine¹ discusses at considerable length the question of **tuberculous peritonitis**, and reviews thoroughly the literature of the subject. In speaking of the treatment Fontaine says that in those cases where surgery finds its best field, there also medicine obtains its best results. In cases of fibrous, caseous, ulcerative, or purulent tuberculous peritonitis it is thought that surgery should play no part in the treatment unless as a palliative measure, except as a relief for constriction of the bowels or other grave complications. In cases of ascites and encystment both medicinal and surgical treatment have given good results; where the kidneys or lungs are involved, surgery is contraindicated. Because there is a tendency in the disease to a spontaneous recovery, and because the statistics of medicinal cures are almost as good as the statistics of surgical cures, and because there is seldom a demand for early surgical interference, it is claimed that medicinal treatment should be given a thorough trial before laparotomy is performed. If prompt improvement, however, does not take place under this treatment, the patient should be put in the surgeon's hands. If the stage of encystment has been reached, prompt surgical interference might be employed, because temporizing may carry the case beyond the aid of surgery. Whatever treatment is employed for the condition, medicinal or surgical, fresh air must be considered an important auxiliary.

A case of **tuberculous peritonitis with obstruction** in which lapa-

¹ Boston M. and S. Jour., Oct. 17 and 24, 1901.

rotomy and a short-circuiting of the small intestine was successfully performed by Watson Cheyne¹ is reported. The patient was a child aged 13 years, who presented all the symptoms of a tuberculous peritonitis with evidences of free fluid in the abdominal cavity. It was noticed that after manipulation coils of small intestine stood out prominently. These coils remained hard and rigid for a few seconds, then a gurgling sound was heard, followed by visible peristalsis, and the gradual subsidence of the prominent coils. During several weeks this condition became gradually more marked, and vomiting became frequent and constipation decided. It was determined that there existed an obstruction of the small intestine, and operation was decided upon. When the abdomen was opened, the small intestine was found congested, distended, and everywhere studded with numerous tubercles. There was not a great deal of matting of the intestine but some bands were found. The omentum did not come into view. The mesenteric glands were enlarged and caseous. Toward the lower end of the ileum a hard nodular mass was found, and this proved to be the seat of obstruction. The portions of bowel above and below this point were anastomosed. It was impossible to find healthy bowel and tubercles were present in the approximated portions of the intestine. Anastomosis was made by means of sutures. Although some evidences of interference with the fecal current were noticed after the operation, all symptoms of acute obstruction subsided and the patient took food well. Gradual improvement took place after the operation, and 18 months later the child was in perfect health and had passed successfully through attacks of pneumonia, measles, and diphtheria.

The **treatment of acute general peritonitis** is summarized by Eugene A. Smith.² Bacteriology presents an ideal classification of acute general peritonitis, but it has been impossible to apply this classification clinically. If it were possible to appreciate the nature of the infection, treatment could be modified to suit the case. It is generally conceded, however, that the treatment of this condition is one which rests wholly in the surgeon's hands. It is true that the opium treatment or the saline treatment may effect a cure in some subacute and chronic forms of general peritonitis due to mild infections by the gonococcus, the pneumococcus, or the colon or tubercle bacillus, but these cases cannot be isolated clinically from those which require more radical treatment. Smith is a strong advocate of laparotomy and saline irrigation, and recommends the use of large quantities of salt solution. The solution should be carried into every portion of the peritoneal cavity by means of a long nozzle. After this treatment patients frequently leave the operating table in a better condition than when they came on. In cases of appendicitis, if pus or sero-purulent exudate is found upon exploring the pelvic cavity, irrigation is employed. Often seropurulent fluid will be found in the pelvic cavity when it is not expected, and when operation is done in the early stages of appendicitis. If this fluid is not removed, it is a menace to recovery. The author employs an aluminium tube to drain the pelvic cavity and gauze wicks to drain other portions of the peritoneal cavity. Dilation of

¹ Lancet, Jan. 18, 1902.

² Amer. Med., Mar. 1, 1902.

the anal sphincter is recommended after the completion of the operation to make the later escape of flatus as easy as possible. Such dilation does not interfere with the retention of salt solution enemas. The after-treatment consists in the free use of strychnin and the administration of salt solution by the rectum in 6 to 8 ounce quantities every 4 to 8 hours, according to the patient's ability to retain the fluid. Morphin is employed for restlessness, hiccupping, and pain, or if the respirations go above 25 to the minute. Whisky by the mouth is given as soon as it can be retained. Calomel is given on the third or fourth day and is followed by a saline. Smith reports 16 cases of appendicitis with seropurulent fluid free in the peritoneal cavity and fibrinous exudate more or less generally present in the parietal and visceral peritoneum, with 4 deaths. Attention is called to the fact that seemingly moribund patients have frequently been saved by surgical interference. Smith does not agree with Abbe, who asserts that casts in the urine in these cases of acute general peritonitis are a contraindication to operative interference.

Hunner and Harris¹ discuss **acute general gonorrheal peritonitis**, reporting 7 cases treated at the Johns Hopkins Hospital and presenting a table of 32 other cases obtained from the literature of the subject. A notable case among those reported is that of a child 10 years of age. A consideration of the results obtained with operation and without operation are compared, and the authors are convinced that surgical measures in gonorrheal peritonitis are of doubtful therapeutic value. Whenever, however, there is reasonable doubt regarding the diagnosis operation should be performed. If the abdomen is opened and a dry plastic peritonitis found characteristic of gonorrheal infection, the intestines should be disturbed as little as possible. Probably nothing is to be gained by attempting to wipe off the fibrinous deposits. Pus tubes found should be removed. Inflamed tubes should not be removed unless the circumstances seem absolutely to demand it. The onset of acute general peritonitis of gonorrheal origin is particularly violent for from 1 to 3 days; the symptoms usually suddenly abate, the patient making a rapid recovery, with, however, probability of intraperitoneal exudate, pelvic adhesions, or pus tubes. In children the disease is particularly fatal. Symptomatic treatment is recommended for this condition with rest in bed.

H. L. Barnard² presents an instructive paper upon the **simulation of acute peritonitis by pleuropneumonic diseases**, describing a number of cases of pleuropneumonia and pleurisy in which the early symptoms were all referred to the abdomen, which was acutely tender, painful and rigid, and in which the respiration was costal, and nausea, hiccup, and vomiting frequently occurred. Most of these cases were diagnosed as acute peritonitis probably due to appendicitis, and some were operated upon, revealing a normal abdominal cavity. Subsequently the symptoms of the true condition became manifest. Barnard believes if surgeons would bear the fact in mind that a beginning pleurisy or pleuropneumonia can produce these symptoms, the mistakes referred to will become less frequent.

¹ Bull. Johns Hopkins Hosp., June, 1902.

² Lancet, April 19, 1902.

Another interesting paper on this subject is presented by Maurice H. Richardson,¹ who reports a case of **acute intrathoracic disease simulating appendicitis**. He refers to a number of similar cases, in some of which the abdomen was opened and the appendix removed. In the case reported the patient was a boy 6 years of age who complained of all the symptoms of an acute appendicitis. Richardson saw this patient on the fifth day of the disease, when the pulse was 120, respiration 40, the abdomen distended and tender everywhere, the legs drawn up, and the temperature 104.5° F. The respiration was noisy and some râles were heard in the lungs. This case was sent to the hospital; the surgeon in charge accepted the diagnosis and operated, removing an appendix which was thought to be the seat of "catarrhal inflammation." Later there developed an empyema which required the resection of a rib and drainage. Richardson thinks that if more attention had been given to the high temperature, and to the character and frequency of the respiration, the mistakes in diagnosis and treatment would not have been made. He refers to 4 other cases in which a similar condition was met, but where, because of his experience with the case reported, he was able to avoid error.

[The subject of the above two papers is one which deserves the careful consideration of every surgeon. In our experience cases similar to those referred to by Barnard and Richardson have been met. As Barnard states, the differential diagnosis can be made if the similarity in symptoms presented by the two conditions is only borne in mind.]

The **significance, pathologic and clinical, of abdominal pain** is discussed at great length by Maurice H. Richardson,² who reaches the following conclusions: "When a patient has been seized with sudden severe abdominal pain: (1) The pain should not be masked by opiates before the surgeon has an opportunity to see the case. (2) The previous history, accompanying symptoms, and physical signs must be carefully considered. (3) Careful examination of the thorax and abdomen in all cases of pain should never be omitted. (4) When hemorrhage is suspected, the abdomen should always be explored. If the patient is in collapse and the pulse apparently too weak to allow the patient to undergo exploration, preliminary infusion of salt solution should be made into the veins or under the skin. (5) When the pain is excruciating and the abdomen shows signs of infection, exploration should be made at the earliest possible moment. (6) The seat of the initial pain, as described by the patient and his friends, is a good guide to the incision, when, from other symptoms, the surgeon is in doubt. (7) The history and signs other than pain must be relied upon for exact or reasonably positive diagnosis. (8) When some of the rarer abdominal lesions are suspected, exploration should nevertheless be made. Such an exploration may be useless, but if resorted to as a routine procedure in all cases, the greatest possible number of lives would be saved. (9) When there is the least question, the genuineness of the pain should be tested as thoroughly as possible. (10) The pain of an atypical typhoid, of a pleurisy, of a pneu-

¹ Boston M. and S. Jour., April 17, 1902.

² Boston M. and S. Jour., Feb. 20 and 27, 1902.

monia, must be guarded against. When typhoid is prevalent in a community, the greatest care must be taken lest the surgeon be misled by the pain of such a case. (11) The observer must be on his guard lest he confuse the pain of simple functional disturbances with that of organic disease; he must rely upon the accessory signs of the organic lesion. (12) When in grave doubt as to the significance of pain and other symptoms, the benefit of the doubt should be given the patient by surgical exploration. (13) Finally, when no exploration is regarded as justifiable, pain should be controlled by morphin, by hypnotics, or, if necessary, by general anesthesia. With very few exceptions, however,—chiefly cases of renal and biliary colic,—the pain that demands general anesthesia demands operation."

Stead¹ reports a case of **intussusception occurring in a woman 72 years of age**. Among 115 cases of intussusception treated at St. Thomas's Hospital from 1875 to 1900 inclusive, and reported by Pitt, there was no case in which the patient had attained the age of 50 years. The patient had suffered frequent attacks of distention of the abdomen due to flatulence which was relieved by the passage of a rectal tube. During stool, the result of a laxative pill, the patient perceived that a mass had protruded from the anus. Upon examination this mass proved to be 8 inches long and consisted of the large bowel. Attempts at reduction were unsuccessful, and even after the abdomen was opened the bowel was with difficulty replaced. The patient denied the slightest strain at stool. [A doubt arises in the reader's mind as to whether this case should properly be recorded as one of intussusception, especially as it seems so much like one of prolapse of the large bowel. (Gibbon operated upon a case of intussusception in a man 58 years of age at the Pennsylvania Hospital. About 8 inches of ileum had passed into the cecum, but such extensive destruction of the bowel was present that 3 feet and 11 inches of ileum were resected and an artificial anus established. The patient died soon after the operation.)]

Balch² reports a case of **intussusception occurring in a girl 16 years of age**. In this case it was difficult to make a diagnosis before operation, the symptoms presented being more those of appendicitis. The patient's leukocyte count was 20,000, and remained high during the convalescence. When the abdomen was opened, it was found to contain considerable free purulent fluid. An intussusception into the ileum was found and the bowel was in such bad condition that resection was determined upon and 56 inches removed. The patient made a satisfactory recovery. Examination of the resected portion showed a polypus almost completely filling the lumen of the bowel. This polypus was undoubtedly the cause of the intussusception.

R. Hamilton Russell,³ of Australasia, presents an interesting discussion of **intussusception in infants**. The large number of cases of intussusception reported and the considerable amount of recent literature on the subject are indicative of a great improvement recently made

¹ Brit. Med. Jour., Nov. 16, 1901.

² Boston M. and S. Jour., Oct. 10, 1901.

³ Intercol. Med. Jour. of Australasia, Mar. 20, 1902.

in the treatment of this condition. Intussusception in infants is a condition which calls for an early diagnosis, and it behooves medical practitioners to give it careful consideration, Russell being convinced that it is a condition which is frequently undiagnosed. When a healthy, plump infant at the breast starts suddenly to scream with pain evidently referable to the abdomen, and vomits and strains and passes bloody mucus by the bowel, the diagnosis is easy, but in a less typical case the diagnosis may be quite obscure. The author pays particular attention to the treatment of intussusception in infants. During the past few years he has treated 22 cases in infants, all but 2 of which were subjected to operation. The cases operated upon are divided into two classes. In the first class Russell gave hydrostatic pressure a fair trial before resorting to operation. Five of the 22 cases were treated on this plan. Of these, 2 died, in 2 reduction was accomplished by hydrostatic pressure, and 1 was successfully operated upon after hydrostatic pressure had failed. Of the 16 cases treated by operation, 12 recovered and 4 died. The 4 fatal cases were all overlooked ones which had been treated for 3 or 4 days by purgatives and other remedies. Among the 12 successful cases, one or two had also been undiagnosed for some time. Russell considers hydrostatic pressure a most uncertain measure, since often a reduction of a large part of an intussusception is possible by this means and yet the apex of the intussusception may remain unreduced. He reports a case which illustrates this statement. The portion of bowel presenting the greatest difficulty in reduction is usually the ileocecal valve. He admits that water pressure is sometimes perfectly efficient, but states that when circumstances admit, immediate operative treatment is preferable. Great care should be observed in the employment of hydrostatic pressure, the water being passed into the bowel very slowly and only by means of a fountain syringe, the funnel being raised only to a height of 2 feet. He prefers in operating upon these cases to make an incision in the median line about $2\frac{1}{2}$ inches in length with about one-third of its length above the umbilicus and passing to the left of that structure. The greatest care is required in manipulating the intestine of infants. Rough handling is much more likely to do harm than a little prolongation of the time of operation. Regarding the after-treatment of these infants, it is the author's habit to allow the child to nurse as soon as it is ready to do so. The first meal is usually vomited, but not the second. In summarizing, it is stated that early diagnosis of intussusception in infants is everything, and that if early treatment is instituted the condition is as amenable to treatment as that of strangulated hernia.

Primrose¹ reports an interesting case of **intussusception** in a child upon whom he operated successfully. The author believes that early operation holds out the greatest prospect of recovery in this condition. The case reported is that of a child $3\frac{1}{2}$ years of age who was admitted to the hospital in the afternoon and operated upon in the evening. The patient presented all the typical symptoms of intussusception. The **sausage-shaped** tumor, however, was curved, with the convexity looking

¹ Canad. Pract. and Rev., Mar., 1902.

downward and inward toward the umbilicus. The intussusception was delivered with great difficulty. The portions of bowel involved were the transverse colon and the splenic flexure. The author found, contrary to the teaching on the subject, that pressure upon the apex of the intussusceptum relieved the intussusception. A considerable portion of the omentum had followed the invaginated bowel and it presented extensive ecchymosis. The apex of the intussusceptum was so much thickened that it was difficult to ascertain that it was pervious. Salt solution injected into the rectum, however, passed through the thickened portion. The patient made a perfectly satisfactory recovery. Primrose refers to 3 other cases, 2 of which he operated upon and 1 of which recovered. One of the cases referred to, and operated upon by Boyd, was very unusual. The patient was a child 5 years of age who was supposed to be suffering from a prolapse of the rectum. The prolapse, however, proved to be the small intestine which had passed into the large bowel and out at the anus. The advancing part of the intussusceptum was found to be the ileocecal valve and the vermiform appendix. The child made a satisfactory recovery after operation. A second case referred to was a baby 5 months old who suffered from two separate intussusceptions of the small intestine. This patient died after operation. A third case is mentioned upon which the author operated successfully after first pumping air into the rectum by Higginson's syringe. Primrose thinks that the inflation method is unsatisfactory, because, although the intussusception may apparently be reduced, the condition may recur. In cases of apparent reduction followed by recurrence it is probable that the invagination was never thoroughly reduced. Operation in cases of intussusception should be performed as early as possible, because the results obtained by early operation are much more satisfactory than those obtained later, since at the early operation reduction is more easily accomplished and complications are seldom met with.

The following interesting case of **intussusception of Meckel's diverticulum** is reported by Wainwright.¹ The patient was a boy 17 years of age who had suffered from a mild intestinal disorder for 4 days before the onset of acute symptoms. On the day before admission to the hospital the patient was suddenly seized with severe pain in the epigastric region followed by obstruction of the bowels and vomiting. High oil enemas were ineffectual and returned colored with blood. The abdomen on admission was retracted and board-like. When the peritoneal cavity was opened, there was a gush of clear serum. The small intestine was found to be greatly distended and the large bowel collapsed. About 3 feet from the ileocecal valve an intussusception of the ileum was discovered and reduced. There were no adhesions and the condition of the bowel when reduction had taken place was very good, except at one portion, where a Meckel's diverticulum was found which was itself the seat of an intussusception measuring about 1 inch in length. This intussusception was also easily reduced and the diverticulum was removed. The patient made a rapid and satisfactory recovery. A microscopic

¹ Ann. of Surg., Jan., 1902.

examination of the diverticulum showed a complete investment of both muscle-layers, but otherwise presented nothing worthy of note. The fact that it presented a muscular coat, that it was situated at that portion of the bowel opposite the mesenteric attachment, and at a distance from the cecum, proved that it was a true omphalomesenteric remnant.

A case of **acute double intussusception** in a female infant 9 months old, in which Bryant¹ operated 24 hours after the onset of the symptoms, and in which a rapid recovery took place, is reported. The case is particularly interesting as there was not only an intussusception of the cecum and a portion of the ileum into the colon, but there was also a retrograde intussusception of the rectum into the descending colon. The recovery of the child is attributed by Bryant to the prompt operation. Only about 4 inches of empty colon separated the two seats of trouble. The presence of but little tenesmus, and the fact that nothing could be made out by digital examination of the rectum, are attributed to the unusual form of intussusception. Mr. Bryant strongly advocates giving to a case of intussusception the same prompt and radical treatment that is given to a strangulated hernia.

Two **unusual cases of intussusception** under the care of J. Rutherford Morison² are reported. The first case is that of an intussusception due to an inverted Meckel's diverticulum occurring in a boy 5 years of age. The abdomen was opened, reduction was accomplished, and the diverticulum was excised. The operation was performed 34 hours after the onset of symptoms. The patient recovered. The second case is that of a man 62 years of age who suffered from a chronic intussusception of the small intestine due to a polypus. In this case the tumor was removed with a portion of the bowel. An end-to-end anastomosis was made by a continuous catgut suture through all the coats, and outside of this an interrupted layer of catgut sutures. The omentum was drawn down and wrapped around the anastomosis. This patient also recovered.

Arthur Connell³ reports 2 cases of **intussusception** in which operation was followed by recovery. One of the patients was a baby 7 months old, and the intussusception was supposed in this case to be due to the fact that the child had the night before the onset of symptoms been fed upon a hard-boiled egg.

Edmund Owen⁴ discusses the question of **intussusception and its treatment**, reporting a successful operation in a child 9 months of age. The author is a strong advocate of early operative interference in cases of intussusception.

An interesting case of **chronic intussusception**, occurring in a man 26 years of age is reported by Quadflieg.⁵ The patient gave a history of having become the victim of a very sudden and excruciating pain in the abdomen 10 weeks previous to admission. Under treatment this pain was relieved, but returned a few days later when the patient resumed

¹ Lancet, Oct. 12, 1901.

² Lancet, June 14, 1902.

³ Quarterly Med. Jour., Aug., 1901.

⁴ Brit. Med. Jour., Sept. 7, 1901.

⁵ Münch. med. Woch., July 2, 1901.

full diet. Restriction of diet and careful treatment again relieved the pain, which, however, returned at intervals, and in a recent attack his physician, upon examining the abdomen, discovered a tumor which he considered to be of either renal or intestinal origin. Upon admission a freely movable tumor could be made out on the left side of the abdomen. When the bowel was inflated by the rectum, the tumor was no longer palpable. At this time the patient was suffering no pain and ate well, but the tumor was tender when handled. The condition was diagnosed as a renal tumor and the left kidney was exposed through an incision in the back; this organ, however, proved to be normal. The abdomen was then opened and the tumor was found to be an invagination of the ileum and cecum into the ascending and part of the transverse colon. A large part of the intussusception was reduced, but $7\frac{3}{4}$ inches were irreducible and resection was performed. The bowel removed consisted of 2 inches of the ileum and $5\frac{3}{4}$ inches of the cecum. Upon examination the portion of the cecum removed was found to be the seat of ulceration. The patient made a satisfactory recovery.

W. Moore¹ reports 3 cases of **intussusception**, all of which recovered. The third case is of particular interest. The patient was a boy 13 years of age who, upon being playfully poked in the ribs by a schoolmate, was suddenly seized with severe pain in the abdomen. Vomiting set in and the patient complained constantly of pain. There was no distention of the abdomen during the first two or three days after the onset of symptoms, but the bowels did not move and distention gradually appeared. Upon the sixth day the patient was sent into the hospital in a very feeble condition; the pulse was 120, and the abdomen was greatly and uniformly distended. Immediate operation was performed and an intussusception of the small bowel was found. The intussusception was reduced after its withdrawal from the abdomen and 2 feet 9 inches of gangrenous bowel resected and an end-to-end anastomosis established by means of a Murphy button. The patient recovered after being extremely ill. The button passed on the eighth day.

Hubbard² discusses **Meckel's diverticulum patent at the navel** and reports an interesting case of a child 1 month old who was operated upon by Dane. The child presented a tumor 1 inch long and $\frac{1}{2}$ inch wide which protruded from the umbilical ring. Attempts by the parent to tie off the tumor resulted in constriction and gangrene of its base. Half an inch of the apex of the tumor was covered by inflamed mucous membrane; in the center of this area was a canal which admitted a probe for the distance of 2 inches. The parents reported that a black discharge with a bad odor had taken place. At the time of admission, however, no fecal discharge was present. When operated upon, the case was found to be one of Meckel's diverticulum patent at the umbilicus. A broad but short diverticulum was found arising from the small intestine; it was removed and the patient made a good recovery. Attention is called to the frequency with which this condition has been mistaken for a simple polyp.

¹ Intercol. Med. Jour. of Australasia, Mar. 20, 1902.

² Ann. of Surg., April, 1902.

The subject of **intestinal obstruction from Meckel's diverticulum** is thoroughly dealt with in an article by A. E. Halstead,¹ who reports a case of his own and presents brief notes of 69 cases collected from the literature of the past 10 years. Halstead's own patient was a man 25 years of age who suffered from symptoms of obstruction of the bowels. When operated upon, the obstruction was found to be due to a Meckel's diverticulum, to the distal end of which was attached a fibrous cord. The diverticulum and the ligament formed a complete ring through which a loop of the ileum had passed and was strangulated. The diverticulum itself was somewhat larger than the ileum and was about $2\frac{1}{4}$ inches in length. The ligament was 3 inches long and was continuous with the root of the mesentery a short distance below the point of origin of the diverticulum. There was no twisting of the diverticulum or of the ligament, nor was there any volvulus of the bowel. The diverticulum was situated about 50 cm. from the ileocecal valve and the portion of the bowel strangulated was the ileum below the point of origin of the diverticulum. The terminal ligament was ligated close to the mesentery and divided, when gas immediately passed into the collapsed bowel beyond. The diverticulum was amputated close to the margin of the bowel, leaving a long opening 2 inches in length which was closed by the Connell through-and-through suture of silk. The operation was done at midnight and the next day the patient's bowels moved freely and he made an uninterrupted recovery. The author then presents the history and origin of Meckel's diverticulum. Cases of obstruction due to Meckel's diverticulum may be divided into 2 classes: (1) Those in which the condition is produced by a free diverticulum,—that is, one having but a single attachment to the intestine; (2) those in which the diverticulum or its terminal ligament is attached to the abdominal wall or some viscus.

Cases belonging to the first class are much rarer than those of the second. A free diverticulum, however, may produce obstruction in one of 5 ways: (1) The ileum may be snared by a noose, or a knot of more or less complicated structure may be tied about a loop or gut; in order that obstruction should take place in this way the diverticulum must be of unusual length, must possess a great range of mobility, and must have a distended or knob-like distal extremity. Treves is authority for the statement that double knots have been found. This condition, however, occurred in none of the cases collected by Halstead. (2) Obstruction may result from kinking of the intestine at the point of attachment of the diverticulum due to the dragging of a long unattached, distended, or cystic diverticulum. (3) Obstruction is frequently caused by twisting of the bowel on its long axis at the point of origin of the diverticulum. (4) Chronic inflammation of the diverticulum and of the neighboring bowel may result in cicatricial narrowing of the intestine above the diverticulum, thus causing obstruction. (5) Inversion of the mucous membrane alone or of the entire diverticulum, with or without invagination of the segment of the gut below the diverticulum, occasionally produces obstruction. The circumstances necessary for the occurrence of this condition are that

¹ Ann. of Surg., April, 1902.

the diverticulum must be of considerable circumference and that it must be free. The condition arises probably when a concretion or a fecal mass is emptied from the diverticulum into the intestine.

Obstruction occurring in the second group of cases—namely, those in which the diverticulum has two attachments—is more common than when the diverticulum is free. Strangulation from an adherent diverticulum may occur in 6 ways: (1) The diverticulum may act as a band which produces obstruction of the underlying intestine; (2) obstruction may result from a loop of bowel passing underneath the diverticulum and then becoming twisted upon itself; (3) volvulus of the diverticulum itself may occur, producing obstruction of the intestine; (4) a diverticulum band may produce strangulation of an overlying portion of bowel under certain conditions; this form is illustrated by Treves, who compares it to a coil of soft rubber tubing thrown over a tightly drawn wire, allowing it to become dependent; (5) obstruction of the bowel by kinking, due to traction on the diverticulum, is more frequent when the diverticulum has a terminal attachment than when it is free; (6) torsion of the diverticulum may occur as well when the diverticulum is attached as when it is free and produces obstruction of the bowel.

A Meckel's diverticulum, although usually producing an acute obstruction of the bowels, may also produce a **chronic obstruction**. This is particularly true when the stenosis of the bowel occurs above the diverticulum. Prolapse of the small intestine through an umbilical fecal fistula sometimes occurs and produces obstruction, but these cases are not included in those collected by Halstead. The author speaks of the importance of attempting in each case of obstruction of the bowels to ascertain the true cause of the condition, but he also states that no time should be lost in making such a diagnosis, as operative interference is imperative in all cases of acute obstruction of the bowels. The following considerations tend to make a diagnosis of obstruction due to Meckel's diverticulum possible: "(1) The age of the patient; it usually occurs in children or in young adults: (2) The history of preceding minor attacks: (3) The configuration of the abdomen which is that of an inverted cone; this being due to obstruction of the upper part of the intestinal tract. The absence of distention of the flanks is conspicuous during the early hours of the attack. (4) Local meteorism, especially upon the right side of the abdomen; under the costal arch, within the early stage, in a few cases, visible peristalsis, prevails. (5) Fecal vomiting, as a rule, comes on early; Cazin lays particular stress on its late appearance. The time when it appears depends, of course, upon the acuteness of the obstruction, and the part of the gut strangulated. (6) Tenderness in the right side on a level with or just below the umbilicus."

Halstead has been impressed with the frequency with which this form of obstruction of the bowels has been mistaken for appendicitis, a mistake which is unavoidable when the diverticulum forms a cyst and is lodged in the right side of the abdomen. McArthur has reported a case in which the diverticulum not only produced obstruction of the bowel, but also constricted the appendix and produced a gangrenous appendi-

itis. Stress heretofore has been laid upon the frequent association of other malformations, such as harelip, club-foot, etc., with Meckel's diverticulum. In the 69 cases collected by the author there was but 1 case of harelip, and no other malformation was associated with the condition. The following is a summary of the collected cases:

Number of cases reviewed.....	69
Males, 44; females, 16. (Sex recorded).....	60
Result noted in.....	66
Deaths.....	45
Recoveries.....	21
Percentage of mortality.....	68.1
Cases operated upon.....	57
Result in cases operated upon mentioned in.....	54
Death in cases operated upon.....	32
No operation in.....	12
Percentages of death in cases operated.....	59.1
Attachment or nonattachment of diverticulum or diverticular ligament recorded in.....	63
Not mentioned.....	6
Attached.....	48
Free.....	15
To mesentery in.....	23
To umbilicus in.....	15
Not determined in.....	3
To mesocolon in.....	1
To mesorectum.....	1
To small intestine.....	3
To omentum.....	1
To periappendicular exudate.....	1

Elliot¹ reports a case of **obstruction of the bowels due to a Meckel's diverticulum** situated about 4 inches from the ileocecal valve, occurring in a girl aged 17, in which a rapid recovery followed operation performed 2 days after the onset of symptoms.

A case of **intestinal obstruction due to a Meckel's diverticulum** which had become gangrenous is reported by Wherry.² The diverticulum in this case was 3½ inches long and had a firm adhesion to the mesentery at its distal end. It thus formed a loop across the mesentery, and in this the small intestine became fixed and strangulated. The pressure of the intestine against the loop caused its distal extremity to become gangrenous. The diverticulum itself possessed no mesentery. The patient, a boy 14 years of age, made a satisfactory recovery.

Borzeky³ reports a case of **intestinal obstruction**, occurring in a man aged 54, resulting from **embolism of the superior mesenteric artery**. The onset of symptoms was sudden, but the patient was not admitted to the hospital for 4 days, when Réczey operated. The patient was in such a weak condition that local anesthesia was employed. A large portion of gangrenous bowel was encountered, but the cause of the obstruction could not be ascertained. Nearly 7 feet of small intestine, from the ileocecal valve upward, showed evidences of gangrene. There was also a universal peritonitis. An artificial anus was established, but the patient died 24 hours after the operation. At the necropsy an embolus two inches in

¹ Boston M. and S. Jour., Oct. 10, 1901.

² Lancet, Aug. 31, 1901

³ Beiträge zur klin. Chir., xxxi, part 3, 1901.

length obstructed the superior mesenteric artery at a point about 3 inches distant from the aorta.

A case somewhat similar to the above is reported by Tyson and Lilington.¹ The patient was a woman 66 years of age who was operated upon for **acute intestinal obstruction**. In this case one foot of gangrenous small intestine was resected and anastomosis performed by means of a Murphy button. The gangrenous mesentery was also removed and the resulting wound was closed with difficulty. The patient died 36 hours after operation. The necropsy revealed an atheromatous erosion of the descending aorta with blocking of the superior mesenteric artery.

Corner² details a most unusual case of **acute intestinal obstruction recurring 7 times in 5 years and relieved 6 times by operation**. The primary operation was done for a strangulated umbilical hernia. A recurrence took place, and strangulation occurred and was relieved by operation. Two years later recurrence and strangulation again ensued. The fourth strangulation occurred 6 weeks later and was relieved by operation. The patient was free from trouble for 2 years, when the conditions previously met with again appeared; 6 months later obstruction occurred again, and was relieved by operation; three months later obstruction occurred, operation was performed, but the cause of obstruction could not be ascertained, and the patient died. The patient was twice operated upon by Mr. Makins, twice by Mr. Battle, once by Mr. Ballance, and once by Mr. Corner. The interesting note is made that no case of femoral or inguinal hernia has been admitted to the St. Thomas Hospital in which strangulation had occurred and been relieved 4 times. Between the years 1891 and 1899, 61 operations were performed for strangulated umbilical hernia, and only 4 of these were upon recurrent cases. Of the operations upon the patient reported, 3 were performed for obstruction produced by adhesions which had taken place between the exposed stump of omentum and the bowel.

Pilcher³ records a case of **intestinal obstruction due to gall-stones**. The patient was a woman 60 years of age who gave no history of gall-bladder disease. She was seized with acute intestinal obstruction and was operated upon 24 hours later. A large gall-stone was found in the small intestine at the duodenojejunal fossa. The bowel was incised near the stone and the latter was extracted. The patient made a good recovery. The stone was spherical in shape, possessing an average diameter of about 1 inch and a circumference of 3 inches. About the bowel there was a localized peritonitis. The weight of the calculus was sufficient to prevent the free movement of the bowel in which it was held, and a mechanical irritation due to its prolonged retention at the most dependent point of this loop produced the peritonitis. Pilcher states that it is not so much the bulk of the gall-stone as it is the development of secondary conditions at some point in the bowel-wall which results in lessening of the contractile propulsive power of the bowel with an accompanying local paresis, which ultimately produces intestinal obstruction. Of 40 cases of

¹ Lancet, May 3, 1902.

² Lancet, Aug. 31, 1901.

³ Med. News, Feb. 8, 1902.

operation for gall-stone obstruction collected by Gibson, 21 were fatal. A study of this series of cases shows that the very high mortality was due to delayed operation. Another noteworthy fact is that three-fourths of these patients were women.

An unusual case of **volvulus from a distended Meckel's diverticulum**, with recovery after operation, is reported by Wm. J. Taylor.¹ The patient was a girl aged 6 years. When admitted to the hospital, she gave a history of having been seized with sudden and acute abdominal pain 48 hours previously. Her physician had been unable to produce a movement of the bowels. On admission the temperature was 100, the patient was suffering from intense pain, and there was marked rigidity of the abdominal muscles with a rapid and weak pulse. From the acuteness of the attack and the symptoms presented a diagnosis of appendicitis was made and immediate operation performed. When the abdomen was opened, a round cystic tumor, very dark in color, was discovered. The small intestine was enormously distended and the tumor could not be delivered until an opening was made in the distended bowel allowing a free escape of gas and feces. The cyst proved to be a dilated Meckel's diverticulum springing from the wall of the ileum about 14 inches from the cecum opposite the mesenteric attachment. The pedicle, which was not larger than a lead-pencil, was twisted upon itself several times. The tumor had no attachment except that to the ileum. It was shaped like a potato, measuring $3\frac{1}{2}$ inches in length and 2 inches in width. The cyst-wall was gangrenous. After removal the diverticulum was found to be distended with liquid feces. The patient made a perfectly satisfactory recovery.

In a clinical lecture Herbert W. Page² discusses a case of **supposed intestinal obstruction due probably to an embolus of the superior mesenteric artery which resulted in gangrene of the stomach and duodenum**. The patient was a man aged 50. Three and a half years previous to the present trouble he suffered from typhoid fever which was complicated by a thrombosis of the right leg; the left leg was afterward twice thrombosed with an interval of a year between the attacks. The present trouble came on suddenly while the patient was walking, and was characterized by severe pain above the umbilicus, which was soon followed by diarrhea, which in turn ceased when vomiting appeared. Morphine gave only temporary relief; the pulse was about 100, and the temperature normal. Abdominal examination was absolutely negative, there being no distention and but slight tenderness. Rectal examination revealed nothing and an enema was ineffective. Tenderness developed 24 hours after the onset of symptoms midway between the umbilicus and the left costal margin, and the pulse rose to 120. The patient was at this time in a serious condition; the vomit was coffee-colored; the abdomen was absolutely flaccid, moving on respiration, and there was but one point of tenderness. The cause of the condition could not be discovered, but operation was determined upon, and when the abdomen was opened, the stomach and duodenum were found greatly distended and their peritoneal coats quite

¹ Bull. Johns Hopkins Hosp., Oct., 1901

² Lancet, May 31, 1902.

purple. An examination of the remaining portion of the intestine showed it to be collapsed. The distention of the duodenum was gradual, as was also the change in its color. The stomach was not opened to relieve the distention, because, from the nature of its wall, it was thought unlikely that the wound would heal. The patient died 3 hours after operation. At the necropsy, which was somewhat unsatisfactory, the findings at the time of operation were confirmed; no definite clot was found in the mesenteric vessels, but there was every evidence that the portal vein was free from clot.

Homer Gage¹ presents an interesting report of a case of **acute intestinal obstruction** occurring in a man aged 80 years. The patient suffered from an acute obstruction 5 years previous to the present attack and was operated upon by McBurney. At this time a malignant growth was found in the lower half of the sigmoid flexure; 6 inches of the bowel, including the growth, was resected and an end-to-end anastomosis with sutures was made. The portion of the bowel involved was not adherent and there was no glandular involvement. Microscopic examination of the tumor showed it to be a carcinoma. Except for a temporary fistula, the patient made a good recovery. At this time the patient was 75 years of age. Five years later, when the patient was 80 years of age, he was again seized with symptoms of acute intestinal obstruction. These symptoms advanced until the vomitus as well as the patient's breath had a marked fecal odor. Gage opened the abdomen and found a coil of small intestine which was constricted by a fatty band which passed directly over it and which seemed to be part of the mesentery of an adjacent coil. In endeavoring to determine the exact nature of this band it ruptured and retracted beyond reach. Because of the patient's condition, and because the obstruction had been relieved, it was not thought wise to carry the investigation any further. The patient made a prompt and satisfactory recovery from this operation. On account of some cough and a rather free expectoration chloroform was used instead of ether. This case is interesting because a thorough examination of the abdomen showed absolutely no recurrence of the malignant disease for which the first operation was performed. It also illustrates the value and importance of early exploration in cases of acute intestinal obstruction even where the patient is old and in a serious condition.

Willy Meyer² reports two cases of **gastroenterostomy and entero-enterostomy** done with the aid of the elastic ligature according to the McGraw method. The method is described as follows: "That part of the gut which is to be anastomosed is stitched to the anterior or posterior wall of the stomach, as the case may be, by a number of interrupted sutures. A fold of the gastric wall is then at its base pierced with a needle, threaded with an elastic ligature, 2 or 3 millimeters in diameter, and the needle with the elastic cord returned through the attached coil of intestine at points corresponding with the entrance and exit of the ligature in the wall of the stomach. The cord is passed through the bowel always in the direction of the longitudinal axis of the latter. In putting it through, it is

¹ Boston M. and S. Jour., Dec. 19, 1901.

² Med. Rec., Jan. 25, 1902.

stretched as much as possible. This renders it thin and small, so that it may be easily drawn after the needle. Its subsequent contraction will then largely increase its size, and cause it more than to fill the orifice. It will even distend the holes so as to prevent any extravasation of feculent fluid. The ligature is tightened as much as possible, and the crossed ends secured by a stout silk thread passed underneath and tied on top. This field of operation is then buried by uniting gut and stomach in front of the ligature by another row of interrupted sutures. It is evident that we have it thus entirely in our hands to arrange the length of the opening." Meyer was so much pleased with the use of the method in the two cases operated upon that he expresses the determination to continue its use whenever possible. One of the claims made for it is that it is the quickest method of anastomosis which we have, and that trial has shown it to be free from the danger of sepsis.

Quénu¹ reports a case of a man 29 years of age who in 1897 was relieved of **cicatricial stenosis of the pylorus** by the performance of a **gastroenterostomy**. Four years later a second operation was performed because of ulceration of the bowel at the seat of anastomosis. The ulcerated bowel was resected, its distal end being attached at the former point of anastomosis and its proximal end attached to the ileum lower down. Quénu says that this case proves that gastroenterostomy does not insure a patient against subsequent ulcerations unless care as to diet, etc., is observed. The secondary ulcer in this case is compared to duodenal ulcer and supposed to have resulted from the corrosive action due to hyperacidity of the stomach.

In describing two cases of **vicious circle after gastroenterostomy**, McGraw² discusses the subject at considerable length, and reaches the following conclusions: "First, the 'vicious circle' may occur whenever the duodenum becomes permanently distended, even though the efferent limb of the jejunum offers an open passage to the ingesta. In all operations of this kind, therefore, an enteroenterostomy should be added to the gastroenterostomy in order that the duodenum may discharge its contents into the efferent portion of the jejunum. Second, it may also occur from obstruction due to spurs, twists, bends, or other entanglements of the intestines. As such accidents may arise from a too short afferent limb of the jejunum, the anastomosis should always be made at such a distance from the duodenum as would make trouble from this cause impossible. The practice of turning the bowel around in order to make its peristaltic movements correspond with those of the stomach has no practical advantage whatever in cases of pyloric stenosis; but, on the contrary, complicates the operation and tends to form a trap in which the intestine may become entangled. It may, besides, drag the wall of the stomach into a fold which may obstruct the opening into the bowel. This method of joining the viscera should be discarded. Third, as the orifices of communication may, if made too small, contract and become obliterated, the opening should be made at least 5 cm. in length. The effects of any

¹ Bull. et Mém. de la Soc. de Chir. de Paris, No 7, 1902.

² Amer. Med., Aug. 3, 1901.

resulting spur-formation will be obviated by the enteroenterostomy. Fourth, the safest and best method of operating is that by the elastic ligature."

Bruce¹ reports a case of **hair tumor** removed from the stomach of a woman 26 years of age. The mass of hair was two feet in length and weighed 23 ounces. The patient complained of absolutely no pain or disturbance of digestion. The presence of the tumor was discovered by her attending physician during pregnancy. The patient was not neurasthenic and denied having swallowed hair. The large end of the tumor occupied the cardiac end of the stomach and the smaller end projected through the pylorus and into the duodenum to the extent of 6 inches.

George P. Jessup² reports a case of **gunshot wound of the stomach**. The patient was operated upon 3 hours after the receipt of the injury and after having been driven 13 miles in a patrol-wagon. He was unconscious on admission and nearly pulseless. Only a small amount of ether was necessary to produce anesthesia. The injury was produced by a 32-caliber bullet which entered 3 inches to the left of the median line and 2 inches below the costal border. The abdomen was opened in the median line and a perforation of the anterior wall of the stomach near the cardiac end was discovered; there was also a slight tear in the right lobe of the liver. As the liver wound had ceased to bleed, no attempt was made to treat it. The wound in the anterior wall of the stomach was closed and an opening was then made through the lesser omentum and through this opening a wound of the posterior wall of the stomach was exposed and closed. After passing through the stomach the bullet perforated the capsule of the left kidney and buried itself in the muscles of the back, whence it was removed 4 weeks later. The wound through the transverse mesocolon had ceased to bleed and required no treatment. The abdomen was filled with free blood and clots, the major part of which was removed by sponges, but no attempt was made to irrigate the abdominal cavity. The abdominal incision was closed and a drain was placed in the bullet wound down to, but not through, the peritoneum. The patient made an excellent recovery without symptoms and was removed from the hospital to prison 19 days after his injury, and was eventually electrocuted at Sing-Sing. Jessup attributes the good results of this case partly to the fact that the incision was not made through the track of the bullet.

Dunham³ showed at the New York Surgical Society a boy 3 years old who had suffered from a **stricture of the esophagus, the result of swallowing a solution of caustic potash**. Attempts to pass an instrument from above were absolutely unsuccessful. Gastrotomy was done, and again an unsuccessful effort made to pass an instrument. A second futile attempt under ether was made 2 weeks later. Dunham finally succeeded in passing a thread through the stricture by getting the patient to drink water through an ordinary glass tube which was first threaded with black sewing-thread. As the child drank the

¹ Canad. Pract. and Rev., Nov., 1901.

² Med. Rec., Feb. 1, 1902.

³ Ann. of Surg., Dec., 1901.

water through the tube the thread was carried down into the stomach, where it was caught and drawn out through the gastrotomy wound. By means of this thread a filiform bougie was drawn up through the esophagus. Attempts to pass the Abbe instrument for the purpose of cutting the stricture, however, were unsuccessful. Dunham then had made an instrument constructed out of a piece of piano wire which carried a number of pieces of spindle-shaped metal. These pieces of metal were attached to the wire at various points and gradually increased in size. The wire was drawn up through the esophagus by means of the thread and then pulled back and forth through the strictured area. During this operation the soft parts of the stomach and pharynx were protected from injury by passing the wire through tubes of aluminum which were properly bent. After dilation by this method esophageal bougies with a conical tip could be introduced. The bougies employed were hollow and were passed on the thread running from the pharynx to the stomach in order to avoid any injury at the seat of the stricture. A No. 30 French bougie was being passed at intervals at the time the case was presented, and the patient was able to eat anything without distress. The gastrotomy wound was gradually closing.

Russell S. Fowler¹ reports a case of **a coin in the esophagus** which was removed by a coin-catcher the movements of which and its relations to the foreign body were observed through the fluoroscope.

In the **treatment of fibrous stricture of the esophagus**, Telleky² reports a number of cases in which he has employed **hypodermic injections of thiosinamin**. This drug was first introduced by von Hebra in 1892, and it is claimed for it that it has the power of increasing existing inflammation and rendering cicatricial tissue soft and pliable. The first case reported is that of a woman who suffered from a fibrous stricture of the esophagus and who was treated for 6 months by dilation. This treatment was satisfactory until a bougie of 9.5 mm. diameter was passed, when further dilation was found to be impossible. Six months later Telleky made 10 injections of from a half to a whole hypodermatic syringe of a 15 % alcoholic solution of thiosinamin. This treatment extended over 2 weeks, the injections being given between the scapulae. Two weeks after the last medication a bougie of the diameter of 12½ mm. was passed with little difficulty. It was found also that the patient could swallow well. Examination with the esophagoscope showed a change in the cicatricial tissue from the previous yellow to a grayish-red color. One year after the treatment the patient showed no relapse. The author refers to other cases in which equally good results were obtained, but also records several cases which show that the use of this drug has positive limitations. It should be used only in old cicatrices in which there is no evidence of inflammation. It must also be remembered that the drug causes a softening of all cicatrices in the body, and the nonobservance of this fact may result in serious difficulty.

Schilling³ describes minutely the use of the **esophagoscope**. Especial

¹ Med. News, Sept. 14, 1901.

² Wien. klin. Woch., Feb. 20, 1902

³ Wien. med. Blatt., Sept. 5, 1901.

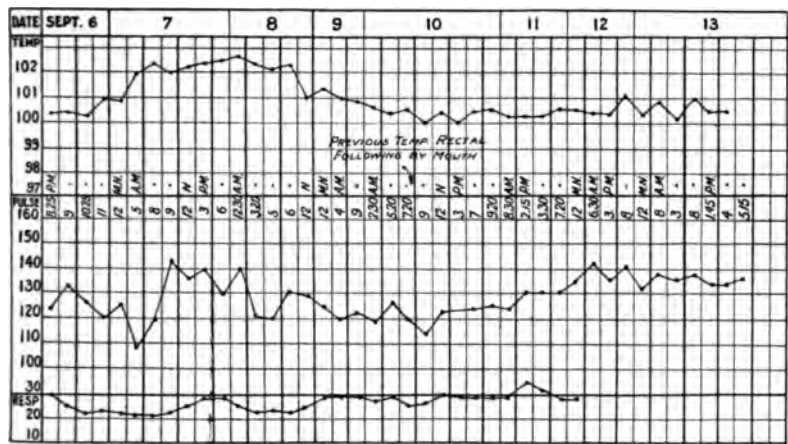
attention is paid to the technic of the instrument and the differential diagnosis of lesions which it may expose.

Zweig¹ reports 3 cases of **deep-seated diverticulum of the esophagus** and describes a method of differential diagnosis between idiopathic dilation of the esophagus and deep-seated diverticulum. Two tubes, each provided with a glass funnel, are passed, one into the stomach and one into the diverticulum. Into the tube entering the diverticulum a weak solution of methylene-blue is passed. The pouch, however, is not filled with the fluid. The stomach filter is now turned downward and slowly withdrawn through the esophagus. If the condition is a dilation, as soon as the eye of the stomach-tube reaches it the fluid will flow from the inverted funnel; and, on the contrary, if a diverticulum is present, no fluid will pass through the stomach-tube in its withdrawal.

An official report of the case of President McKinley, which is signed by P. M. Rixey, Matthew D. Mann, Herman Mynter, Roswell Park, Eugene Wasdin, Charles McBurney, and Charles G. Stockton, appears in "American Medicine," October 19, 1901. The President was shot by Leon Czolgosz in the Temple of Music at the Pan-American Exposition, Buffalo, N. Y., at 4.07 o'clock, September 6, 1901. He was immediately removed to the Emergency Hospital in the Exposition grounds. Dr. Mynter examined the patient at 4.45 o'clock. At this time his pulse was 84, he had no particular pain in the abdomen, and there was no apparent loss of liver dulness. Dr. Mann saw the patient at 5.10 p. m. After a consultation immediate operation was decided upon. Dr. Mann performed the operation, assisted by Dr. Mynter. Dr. Wasdin administered the anesthetic. The operation was begun at 5.29, 1 hour and 22 minutes after the receipt of the wound. Dr. Roswell Park arrived during the progress of the operation and acted as consultant. The patient was under the influence of the anesthetic in 9 minutes. A slight superficial wound was found between the second and third ribs a little to the right of the sternum. This was probably the result of a bullet striking a button or some object in the clothing which had deflected it. A second wound, caused by a 32-caliber bullet, was about half-way between the left nipple and the umbilicus on a line drawn between these two points. An incision passing through the bullet wound was made into the abdomen. A short distance beneath the skin a portion of clothing was removed from the track of the bullet. When the abdomen was opened, a perforation was discovered in the stomach near the greater curvature and about 2 cm. from the attachment of the omentum. The stomach was withdrawn from the abdomen, the wound slightly increased, and digital exploration of the stomach performed. The organ was found to be half-full of liquid food. The tissues about the wound were carefully irrigated with hot salt solution and the perforation in the anterior wall was closed with a double row of silk sutures. In order to expose the posterior wall of the stomach the gastrocolic omentum was divided for 4 inches and its edges retracted. The wound in the posterior wall of the stomach was somewhat larger than that in the anterior wall and presented frayed and blood-

¹ Deut. med. Woch., Aug. 15, 1901.

infiltrated edges. It was impossible, because of the thickness of the abdominal wall and of the omentum, to determine the position of this wound absolutely, but it appeared to be near the greater curvature. There was little or no gastric effusion around this opening; after it was closed, however, the parts were irrigated with hot salt solution. No trace of the bullet could be found, and it was thought unwise to prolong the search. The folds of the intestine below the stomach, however, were carefully searched for injury. The tissues around the track of the bullet in the abdominal wall were trimmed in order to remove any tissue which might be infected. The wound of the abdominal wall was closed with 7 through-and-through silkwormgut sutures and the fascia of the rectus muscle was approximated with a buried catgut suture; no drainage was employed. The duration of the operation was 1 hour and 31 minutes. The patient stood the operation well and showed little evidence of shock.



.16.—Chart of President McKinley's temperature, pulse, and respiration (Amer. Med., Oct. 19, 1901).

Morphin was administered to the patient and he was removed to the home of Mr. Milburn.

The operation was performed under considerable difficulty, the absence of certain instruments and a poor light greatly interfering with the operator. The great thickness of the patient's abdominal wall and the large amount of fat present were also factors which impeded the work. After the operation the patient was given sufficient morphin to keep him quiet. Saline enemas were also administered and later nutrient enemas. Digitalis and strychnin were administered at regular intervals. The patient's urine was examined each day and was normal except for a small amount of albumin and a few small finely granular casts. On the third day the patient was given a teaspoonful of water by the mouth. At this time his bowels moved. On the fourth day codein was substituted for morphin, and the digitalis and strychnin were stopped and hot water was taken freely by the mouth. The bowels moved freely on the fourth day,

the result of a small dose of calomel and a high enema of ox-gall. At this time the patient's condition was particularly favorable; he slept well and was fairly comfortable. On the fifth day he was still better, but there was some evidence of infection of the abdominal wound, requiring the removal of the stitches. On the sixth day he was given a small amount of beef-juice, this being the first food taken by the stomach. On the seventh day he was feeling better and was able to take beef-juice and a little chicken broth and also a little whisky and water. At this time he was apparently in excellent condition and a favorable prognosis was given. His bowels had moved, he had passed gas freely, his tongue was clean, his appetite good, there was no pain or tenderness in the abdomen, and he was able to turn easily upon his side. The amount of urine had steadily increased, and the patient's mental condition was good. His pulse had remained frequent, but was strong and of a good quality. The frequency of the pulse was the only symptom which caused any uneasiness. The President's normal pulse, however, was rapid. The open wound was healthy and progressing favorably. Toward noon on the seventh day the character of the pulse was not so good, and strychnin and digitalis were resorted to. Gradually the pulse went to 130 and grew weaker. As no free movement of the bowels had been obtained, oil and calomel were given at this time and all food by the stomach was stopped. At 11 p. m., 420 cc. of normal salt solution were given subcutaneously. In spite of every form of stimulation the patient gradually grew weaker, and died at 2.15 on the morning of the ninth day.

The autopsy was performed by Dr. Gaylord and showed that the openings in the stomach-wall had been effectually closed, firm adhesions being found both upon the anterior and posterior walls of the stomach. There were some necroses surrounding the wounds in the stomach, the cause of which could not be determined. "It is highly probable that they were practically terminable in their nature and that the condition developed as a result of lowered vitality. . . . The fact that the necrotic tissue had not been affected by digestion strongly indicates that the necrosis was developed but shortly before death." There was present a grazed wound of the superior aspect of the left kidney. There was also some injury of the pancreas which was not thought to be due to the direct action of the ball. There was, however, considerable necrosis of the pancreas. There were no fat necroses in the neighborhood of the pancreas, which indicates that there was no leakage of pancreatic fluid into the surrounding tissues. The bullet was not found, though it is supposed to have been lodged in the muscles of the back. The changes found in the heart, both upon macroscopic and microscopic inspection, indicate that this organ had considerable to do with the death of the patient. "An extensive brown atrophy and diffuse fatty degeneration of the muscle, but especially the extent to which the pericardial fat had invaded the atrophic muscle-fibers of the right ventricular wall, sufficiently explain the rapid pulse and lack of response of this organ to stimulation during life."

The bacteriologic examinations were made by Dr. Matzinger. His

report may be condensed into the statement that cultures from the various parts of the peritoneal cavity were absolutely negative, as were also cultures from the blood of the right auricle. Cultures taken from the contents of the necrotic cavity back of the transverse colon, involving the pancreas, revealed nothing but a short stumpy bacterium. In this tissue were found no leukocytes, no blood-corpuscles, but an abundance of crystals which appeared more like fatty acid than fat crystals. It contained no free hydrochloric acid and was alkaline in reaction.

An examination of the chambers and barrels of the weapon used, as well as of the empty shells and cartridges, was entirely negative, except that from a loaded cartridge there was grown an ordinary staphylococcus and a mold. "The absence of known pathogenic bacteria, particularly in the necrotic cavity, warrants the conclusion that bacterial infection was not a factor in the production of the conditions found at autopsy."

In discussing the **obstructive diseases of the lower bowel and their treatment**, H. O. Marcy¹ pays particular attention to the question of cancer. When malignant growth of the lower bowel has reached a size sufficient to produce obstruction, little can be hoped for except palliation by colostomy. With improved technic and greater experience the number of operable cases has greatly increased. The important point in deciding whether operation is proper is not so much the portion of the bowel involved as it is the fact that the disease is apparently absolutely local. If there is distinct evidence of glandular involvement, it is very doubtful whether operation is advisable. In such cases, however, colostomy gives great relief and prolongs life. The writings of Kocher and Kraske have done much to teach us how to remove malignant growths of the rectum and sigmoid. The mortality of the Kraske operation is much less than it was a decade ago, because of improved technic and earlier diagnoses. Growths of the lower bowel can be dealt with in a remarkably satisfactory manner by opening the abdomen with the patient in the Trendelenburg position. The rest of the peritoneal cavity can be well protected with gauze pads, the parts operated upon being placed within the control of the surgeon. After resection of the diseased bowel the proximal end can be brought down and attached to the distal end either by a Murphy button or sutures, or a colostomy may at once be performed. Wyeth has recently described a modification of this combined operation which he has employed on 3 occasions. He suggests, first of all, the dilation of the sphincter ani and the cleansing of the bowel; next, the opening of the abdomen and the resection of the diseased portion of gut. Through the lumen of the lower segment of healthy bowel long forceps are passed and the upper segment is caught and drawn down through the anus. With it comes the cut edge of the lower segment, and the two can be sutured with little difficulty. Marcy regards the method of approaching the lower bowel through an abdominal wound as a great advantage, since it permits thorough examination and removal of the lymphatic glands and more accurate resection of the diseased bowel.

A **successful operation for typhoid perforation** is reported by

¹ Boston M. and S. Jour., Sept. 5, 1901.

Francis T. Heuston.¹ The patient was a woman 34 years of age, who was apparently convalescent after an attack of typhoid fever, the temperature having remained normal for 4 days. At this time, however, she was seized with sudden severe pain in the abdomen, followed by collapse, the pulse rising to 160 and the temperature subsequently mounting to 104°. Operation was undertaken 4½ hours after the onset of the symptoms. The peritoneal cavity was found to contain a large amount of dark fluid, undoubtedly the contents of the intestines. A small perforation was found 8 inches above the cecum from which the intestinal contents were oozing. At another point in the ileum evidence of a large ulcer was found, but there was no other perforation. The perforation was inverted by a continuous silk suture over which were passed a number of Halsted's sutures of catgut. The peritoneal cavity was thoroughly irrigated with salt solution and closed without drainage. The patient made a satisfactory recovery without an unfavorable symptom.

Robert Abbe² reviews briefly the **surgical complications of typhoid fever**, referring first to bone abscess which shows a marked predilection for the tibia. A slight injury to the bone is sufficient to determine the site of the abscess. In most of these post-typhoidal bone abscesses the typhoid bacillus is found alone or in connection with the staphylococcus; in some cases, however, the pure staphylococcus is found. In the synovial sheaths of the tendons and in joints there is frequently initiated a synovitis, from which, however, the infecting bacillus quickly disappears, and irritation is almost sure to quiet down and leave behind it only rarely any fibrous ankylosis or pus. This statement, however, does not apply to the hip-joint, in which a synovial distention takes place with a subsequent luxation of the femur. Destruction of the laryngeal cartilages from necrosis is a most dangerous and fatal surgical complication of typhoid fever, producing death from suffocation in 75 % of the cases not operated upon and a mortality of 50 % even if tracheotomy is performed. The beginning of the condition is indicated by hoarseness, and the edema which follows takes place with such rapidity as to make tracheotomy an operation of emergency. Femoral phlebitis is a most common complication of typhoid fever. This condition is sometimes so severe that blockage of the iliacs may be produced, resulting in gangrene of the leg. The phlebitis is met four times as often in the left femoral vein as in the right. Keen explains this by the fact that the left common iliac vein passes below the right common iliac artery which produces a certain amount of pressure upon it. Even when the extreme varicosities of the left superficial veins extend to the femoral and pubic they can be safely and permanently relieved by operation without danger to the life of the foot. Regarding carotid swellings occurring during or after typhoid fever, Abbe recommends that these should not be incised until pus has been definitely demonstrated by the lapse of time or by aspiration.

The peritoneal coat of the intestine is invaded by ulceration about once in 100 cases. **Typhoid perforation** is usually of a size large enough to admit the end of a lead-pencil. A slow extrusion of the intestinal

¹ Brit. Med. Jour., Nov. 16, 1901.

² Med. News, Mar. 29, 1902.

contents and of gas seldom takes place, as is shown by the few spontaneous recoveries which have occurred. The acute tearing pain with which the patient is suddenly seized is indicative of the pouring-out of a large amount of the intestinal contents. The best results of operation have been obtained when it is performed between the twelfth and eighteenth hour after the onset of symptoms. Abbe has operated upon 5 cases with 1 recovery.

Ash¹ reports a case of **intussusception occurring as a complication during the course of typhoid fever**. The patient was a soldier 25 years of age. On the ninth day of a relapse he was suddenly seized with acute abdominal pain, which passed away, only to return within an hour with vomiting. The patient presented an anxious expression and perspiration was profuse; the abdominal muscles were board-like but there was no distention; the pain was referred to the umbilical and epigastric regions. The abdomen was opened under chloroform anesthesia 6½ hours after the first onset of symptoms. When the patient was anesthetized, a mass could be palpated in the right inguinal region, which mass appeared spherical in shape and was dull on percussion. Because of pain a thorough palpation of the abdomen could not be carried out prior to anesthetization. When the abdomen was opened, an intussusception was found measuring about 6 inches in length. The cecum contained a number of inches of indurated and thickened ileum. The inflamed condition of the ileum lent additional danger to the reduction of the bowel, but this was accomplished without serious injury. The abdominal cavity was flushed with sterile water and the abdominal wound closed without drainage. The patient's fever continued for 9 days after the operation, but was entirely unassociated with abdominal symptoms. He made a satisfactory recovery.

Wm. L. Rodman² reports a case of **typhoid perforation in which recovery followed operation**. The patient was a girl 12 years of age. At the time of operation she was in an extremely bad condition, the symptoms of general peritonitis being marked. Operation was performed 37 hours after the perforation. The ulcer was inverted by a single layer of Lembert sutures. The abdominal cavity was thoroughly flushed with saline solution, a gauze drain was packed about the diseased bowel, and a glass drainage-tube was introduced at the lower end of the wound. The time of the operation was 16 minutes. During the operation and just afterward hypodermoclysis was employed. The tube was removed 1 week after the operation, and the gauze had been entirely removed at the end of 10 days. Prior to operation the patient was vomiting frequently; her pulse was so rapid as to be hardly countable, and the abdomen was enormously distended. This case teaches that operation should be undertaken even when the patient's condition is apparently hopeless, and also that a general anesthetic can be borne by a patient in such a condition. Cocain was thought of in this case, but as little coöperation could have been obtained because of the age of the patient, ether was decided upon. On the day preceding the perforation the patient complained of sudden

¹ Brit. Med. Jour., May 3, 1902.

² Amer. Med., Nov. 23, 1901.

pain in the abdomen which was accompanied by a nervous chill lasting 20 minutes. This symptom is one which Cushing has described as indicating a preperforative stage.

An interesting case of **typhoid perforation followed by subphrenic abscess**, in which recovery from both conditions was obtained by operation, is reported by Herbert A. Bruce.¹ The patient was a man 29 years of age. The perforation occurred on the fourteenth day of the disease. Bruce saw him 30 hours after the onset of symptoms and 18 hours after the supposed time of perforation, and operated immediately. At the time of operation the patient's temperature was 103.5° F., the pulse 126, and the respirations 22. The abdomen was flat, rigid, and tender. The facial expression was anxious and like that usually seen in peritonitis. A small perforation of the ileum was discovered 10 inches from the cecum. Marked general peritonitis existed and there was about one pint of sero-purulent fluid in the peritoneal cavity. There were numerous pieces of lymph adherent to the ileum in the neighborhood of the perforation. The ulcer was inverted by a double row of Lembert sutures, the peritoneal cavity was flushed with hot salt solution, and an iodoform drain was introduced. Strychnin hypodermatically and hot salt solution by enemas were given frequently after the operation. Two weeks after the operation there was an accumulation of pus about the rectus muscle which required drainage. Four days later the patient developed symptoms of abscess of the liver. Bruce made an incision exposing the liver through the peritoneum and evacuated from it a considerable quantity of pus. Exploration of the abscess-cavity, however, showed that there was an accumulation of pus behind the liver, and this was drained by a second opening in the tenth intercostal space. Drainage was maintained through the posterior opening, and although the patient was greatly shocked after the operation, he responded to the use of salt solution and strychnin and ultimately made a perfectly satisfactory recovery.

The case of a 16-year-old boy, who 4 months after a **typical attack of typhoid fever** developed a **dissecting abscess of the abdominal wall** which produced a deformity closely simulating **Pott's disease**, is reported by Jas. B. Bullitt,² who, after discussing the subject, reaches the following conclusions: (1) Abscess of the abdominal wall without any connection with the abdominal cavity occurs most frequently as a result of typhoid fever and readily heals after incision and drainage. (2) The larger dissecting abscesses of the abdominal wall, communicating with some portion of the intestinal tract at their inception, occur most frequently as a sequel of typhoid fever or appendicitis, and result from an adhesion between the parietal peritoneum and a viscus, with perforation of the latter. Such abscesses after rupture follow the course of fecal fistula, and heal sometimes spontaneously, or, as a result of incision with drainage, only after the communication with the intestine has become obliterated. This obliteration, although sometimes occurring spontaneously, at other times must be brought about by operative procedure. (3) A

¹ Canad. Pract. and Rev., Mar., 1902.

² Jour. Am. Med. Assoc., Nov. 30, 1901.

dissecting abscess may produce symptoms and deformity simulating Pott's disease; on the other hand, Pott's disease with abscess appearing after an attack of typhoid fever may be confounded with abscess resulting from the typhoid process.

The subject of **duodenal ulcer and its surgical treatment** is discussed at some length by B. G. A. Moynihan,¹ who presents a table of 49 cases of perforating duodenal ulcer, to which he adds 2 upon which he has operated. The author also refers to 4 cases of chronic duodenal ulcer which he has operated upon. Ulcerations of the duodenum may be divided into acute and chronic. The ulcer is usually situated in the first part of the duodenum. The disease does not seem to be confined to any particular age, one case being reported in a child of 10 years and another in a woman of 94 years. All authorities agree that the condition is more frequent in men than in women. It is frequently found post-mortem when no symptoms have been evident during life. The cardinal symptoms are pain, hematemesis, and melena. The latter symptom is frequently overlooked. Pain usually comes on an hour or more after taking food, and is referred to the epigastrium or right hypochondrium, varying greatly in intensity. The time at which pain is experienced after taking food, Moynihan believes, will be found an aid in diagnosing the position of the ulcer. If an ulcer is situated in the body of the stomach or near the cardia, the onset of pain is prompt; whereas if the ulcer be in the duodenum, pain is considerably delayed. Hematemesis is not a common and is a rather erratic symptom, occurring in about one-third of the cases. The bleeding is seldom severe. The complications of duodenal ulcer are profuse hemorrhage, perforation (acute, subacute, and chronic), cicatricial contraction, periduodenitis, and cancer. In 20 cases collected by Perry and Shaw 9 patients died from hemorrhage, 8 from perforation, 3 from cicatricial contraction of duodenum or bile-duct. The symptoms of perforation differ little from those of perforating gastric ulcer. In 18 out of 49 cases fluid collected in the lower part of the abdomen and gave rise to symptoms of appendicitis. When operating for perforated duodenal ulcer, the utmost speed consistent with safety is desirable. Excision of the ulcer is unnecessary, and in fact harmful, as it consumes time. Drainage should always be employed. Of the 49 cases collected by Moynihan and operated upon at varying periods after the onset of symptoms, 8 recovered. Of the two additional patients operated upon by the author, one recovered. In this successful case the operation was performed 3 hours and 50 minutes after perforation. Of the 4 cases of chronic duodenal ulcer which he operated upon, all recovered.

A case of **successful operation for perforated duodenal ulcer** is reported by Marmaduke Sheild.² The patient was a man 36 years of age, who walked into St. George's Hospital 4 hours after having been seized with violent abdominal pain which was accompanied by vomiting, collapse, and profuse sweating. This condition had somewhat improved and he had walked to the hospital. The patient had never suffered from a similar attack and gave no history of gastric trouble. His temperature

¹ *Lancet*, Dec. 14, 1901.

² *Lancet*, Mar. 29, 1902.

and pulse were normal, and, except for colicky pain and slight epigastric tenderness, symptoms were absent. The patient, however, was put to bed and watched. His pulse gradually increased in frequency; at 6 P. M. it was 96, at 10 P. M. 110, at midnight 116, and at 2 A. M. 128. The abdomen became markedly rigid and tender and vomiting occurred at intervals. The liver dulness also gradually decreased. The next morning the patient was seen by Mr. Sheild and operation was performed 28 hours after the perforation. A large amount of fecal extravasation had taken place and a duodenal perforation was found on the anterior aspect of the duodenum just beyond the pylorus. This was closed with two rows of Lembert sutures and an omental graft was sewn over the site of repair. The abdominal cavity was thoroughly irrigated and closed without drainage. The operation lasted 25 minutes. For 4 days the patient was fed entirely by the rectum, and he made a perfectly satisfactory recovery.

Another **successful operation for perforated duodenal ulcer** is reported by Lucy.¹ The patient was a man 61 years of age, who, when lifting poles onto a wagon, was suddenly seized with severe sharp pain above and to the right of the umbilicus. He walked home and attended to his horses, but later the pain became worse and vomiting set in. He gave a history of having suffered from pain after nearly every meal for several years, and in order to be comfortable lived largely upon "slops." He was admitted to the hospital about 20 hours after the onset of symptoms and immediate operation was performed. A small punched-out ulcer in the second part of the duodenum was found and sutured with great difficulty. The abdominal cavity was irrigated and closed without drainage. The patient made a complete recovery, and was perfectly well 4 years after the operation, being able to "eat anything" without the slightest discomfort. A notable point in this case was the retracted abdomen 19 hours after the extravasation of the duodenal contents and a marked rigidity of the right as compared to the left rectus muscle even after the administration of the anesthetic.

Two **fatal cases of perforated duodenal ulcer** are reported by Clarke and Franklin.² The first patient was a woman 20 years of age who gave a history of pain and vomiting after food for several months. Twenty hours before admission she was suddenly seized with severe pain in the abdomen and collapsed. On admission she was pale and collapsed, the abdomen was distended, and there was increased resistance and tenderness in the epigastric region. When the abdomen was opened, a perforated ulcer of the anterior wall of the stomach was found and repaired. A second opening was made below the umbilicus and the abdomen irrigated and drainage established. Five days after the operation the patient presented symptoms of general peritonitis and died. At the postmortem it was found that the repair of the gastric ulcer had been complete, but that perforation of the duodenal ulcer had taken place. The second case was a man 45 years of age who was admitted with all the symptoms of a perforative peritonitis. The symptoms pointed to the

¹ Lancet, May 24, 1902.

² Lancet, Nov. 2, 1901.

appendix as the seat of trouble. When the abdomen was opened, this organ was found distended and inflamed and was removed. The abdominal cavity was full of fecal-smelling pus. The patient's condition was so bad that a hurried irrigation of the abdomen was done and drainage instituted. The patient died 5 hours after operation. At the necropsy a perforated ulcer on the anterior wall of the first part of the duodenum was found. Two other ulcers of the duodenum were present and 2 small superficial ulcers of the stomach.

Alexander Blayney¹ discusses the question of the **removal of great lengths of intestine** and reports a case operated upon by Hayes in which 8 feet 4½ inches (255 cm.) of small intestine was removed. The patient was a boy 10 years of age who was run over by a heavy wagon. He presented all the symptoms of a grave abdominal lesion, and operation was at once performed. A long transverse rent was found in the mesentery about 3 inches from the intestine, cutting off the blood-supply of the portion of bowel removed. An end-to-end anastomosis was performed by means of a Murphy button. The patient reacted well from the operation, though he suffered during convalescence from attacks of vomiting and looseness of the bowels. Eight months after the operation, however, the patient had increased in weight, vomiting had ceased, and his bowels were moving but twice a day. The lower limit of the bowel removed extended to within 5 inches of the ileocecal valve. In deciding the probable effects of the removal of large portions of the intestine it is important to bear in mind that it is not so much the length of bowel removed as it is the portion which is removed. The removal of the jejunum will produce much more serious consequences than the removal of an equal length of the ileum. The important question is how much bowel remains behind after the excision. This will always be a matter of doubt, since Treves has shown that the length of the intestine may vary from 31 feet 10 inches to 15 feet 6 inches, these being the extreme measurements found in the examination of 100 bodies. To Dreesmann's 26 cases in which more than 3 feet 3 inches of bowel were removed the author adds 7 which he has collected from literature. In 9 of the 33 cases death occurred soon after the operation. In the majority of the cases recorded the ileum was the portion of the bowel removed. Ruggi's case is the one in which the greatest length of intestine (11 feet) has been successfully removed. A study of these cases leads Blayney to the belief that in adults when the intestine removed is less than 200 cm. intestinal disturbances will probably be absent, and when more than 200 cm. are removed intestinal disturbances will be present. Children apparently stand the removal of large portions of intestine better than do adults. The question of how much intestine can be removed is more a physiologic than a surgical one, since the surgeon finds himself in the position of having no choice but being obliged to remove all of the diseased or injured portion of the bowel regardless of the result.

Petersen² discusses the **anatomy of Von Hacker's operation of**

¹ Brit. Med. Jour., Nov. 16, 1901.

² Beiträge zur klin. Chir., Bd. xxix, Heft 3 (Schluss).

posterior gastroenterostomy, dealing particularly with the objections which have been raised to this operation. It is suggested that in those cases in which regurgitation has occurred it has resulted from a misunderstanding of the technic of the operation and the anatomic points involved. Of 215 posterior gastroenterostomies performed in Czerny's clinic, no instance of regurgitation occurred. Of these operations, 170 were performed with the Murphy button and 45 by means of sutures. In 60 cases reported by Von Hacker serious regurgitation was met but once. Petersen shows that the jejunum passes for quite a distance in the vertical direction along the posterior stomach-wall, being separated from this structure only by the mesocolon. This fact must be borne in mind by the operator, and the length of the efferent loop must be equivalent to the distance from the plica duodeno-jejunalis to the site of the anastomosis. The length of this bowel will vary according to the amount of dilation of the stomach which is present. When the jejunum in this position is united to the stomach, there is no right or left portion, but rather one section of the bowel above and one below the new opening. When the gastroenterostomy is performed in this manner, all accessory operations are superfluous. When properly performed, regurgitation cannot be looked upon as a contraindication to the Von Hacker operation. Stenosis of the opening in the mesocolon has been suggested as an objection, but this can be easily obviated by suture of its cut edges to the stomach-wall. Gangrene of the colon, which is also mentioned among the objections, can be avoided by choosing for the perforation a place in the mesocolon that is void of vessels. Compression of the anastomotic loop by the colon or closure of the opening between the stomach and bowel is of the rarest occurrence. The only real objection to the operation is its difficulty, and its advantages over the anterior gastroenterostomy far outweigh this objection. Petersen states that the Murphy button greatly facilitates the performance of the operation.

Jacob Frank¹ urges the **employment of appliances of the Murphy button type** in preference to the suture methods for intestinal approximation, calling attention to the fact that many surgeons who condemned the use of the Murphy button some years ago are now using it extensively. It is claimed that none of the suture methods present so low a mortality or possess so many excellent qualities as the Frank coupler or the Murphy button. Von Chlumsky, by subjecting all methods of intestinal anastomosis to the hydraulic pressure test, has demonstrated the fact that the coupler or button is much more satisfactory than any of the suture methods. In end-to-end anastomosis particularly are the advantages of the button and coupler over the suture methods most marked.

A case of **extensive resection of the small intestine** is reported by Lauwers.² The operation was performed on a woman 67 years of age who suffered from a fistula consequent upon an operation for a large ventral hernia. Thirty-six inches of the small intestine were removed because of its adhesion in an inseparable mass. Not only was 36 inches

¹ Ann. of Surg., Jan., 1902.

² Jour. de Chir. et Ann. de la Soc. Belge de Chir., No. 12, 1901-02.

of bowel removed, but the proximal end of the small intestine was anastomosed to the sigmoid flexure, thus excluding 64 inches of the large intestine. The patient was quite well after 2 years except for a tendency to diarrhea after any irregularity in diet. The author believes that it is possible to remove half of the small intestine, provided the portion removed consists largely of the ileum, without subjecting the patient to the danger of starvation.

Wm. J. Mayo¹ writes upon **carcinoma of the cecum** and reports 2 cases in which the cecum was removed for malignant disease. Ewald has collected 1148 cases of intestinal cancer; in 64 instances the disease was situated in the cecum and in 26 in the ileum. Lymphatic infection is found in less than one-half the cases dying from intestinal carcinoma. The malignant growth usually originates at the ileocecal junction and has a tendency to produce obstruction. The symptoms are colicky pains, constipation alternating with diarrhea, and progressive wasting. The tumor may sometimes be felt. A differential diagnosis between malignant disease of the cecum and a chronic appendicitis is very difficult. Occasionally the symptoms come on suddenly, being ushered in by an attack of acute obstruction of the bowels, and, in other instances, by an acute intussusception. Both tuberculosis and syphilis may produce inflammatory thickening of the cecum which will render diagnosis difficult. The author recommends the formation of an anastomosis between the end of the ileum and the side of the colon above the seat of disease, and then the extirpation of the cecum. If it is found difficult to approximate the cut end of the ileum and the side of the colon, then a side-to-side or end-to-side anastomosis between the ileum and the transverse colon may be made. Mayo has excised the cecum 4 times; twice for malignant disease, once for tuberculosis, and once for chronic intussusception. All the patients recovered from the operation. He operated upon his first case of carcinoma of the cecum on April, 1899, and the patient is now able to continue his work. In this case a diagnosis of chronic appendicitis has been made. The second case was operated upon in January, 1901, for carcinoma of the cecum, and in this case the condition was believed to be one of chronic appendicitis.

W. L. Conklin² reports a **successful case of excision of the cecum for carcinoma**.

The **implantation of the transverse colon into the rectum and anus** is recommended by F. De Quervain³ as preferable to the establishment of an artificial anus in extensive resections of the descending colon. Kummell, of Hamburg, transplanted the transverse colon to the anus in 2 cases in which he resected the rectum, the sigmoid, and part of the descending colon, once for tuberculosis of this portion of the large bowel, and once for syphilitic stricture. He believed the operation to be practicable because of the well-developed marginal artery which supplies the transverse colon, permitting of a division of its mesentery without interference with its nutrition. In the lower portions of the large bowel

¹ Jour. Am. Med. Assoc., Oct. 19, 1901.

² Buffalo Med. Jour., Oct., 1901.

³ Rev. Méd. de la Suisse Rom., Dec. 20, 1901.

the marginal artery is poorly developed, the blood-supply being carried on by vessels which enter the bowel at right angles to its long axis. De Quervain reports a case of a woman 50 years of age upon whom he operated in June, 1901, performing a radical cure for left inguinal hernia, a median laparotomy for the fixation of the round ligaments of the uterus, anterior colporrhaphy, and perineoplasty. The operations were performed at one sitting and in the order named. During the performance of the vaginal operation a small tumor was felt in Douglas's pouch. As it was impossible to reach this from the vagina, the median abdominal wound was reopened. The mass felt per vaginam was found to be a small cancerous stricture of the lower part of the sigmoid flexure which also involved the mesentery. The diseased portion of bowel and mesentery were excised, but it was found impossible to approximate the remaining portions of the rectum and sigmoid. A division of the colon was made at the splenic flexure and the mesentery and gastrocolic ligaments were divided sufficiently to allow this portion of the bowel to be carried to the lower portion of the pelvis. The excluded portion of the bowel—that is, the descending colon and a portion of the sigmoid—was treated by closure of the upper end and the fixation of the lower end in the abdominal wall. The remaining portion of the rectum was then inverted and brought out at the anus. The transverse colon was brought down through the inverted rectum and both were fixed at the anus. A large tube was then introduced into the transverse colon and a tampon was placed in Douglas's pouch. There was after the operation some fecal extravasation through Douglas's pouch. In October the patient suffered from chronic obstruction of the bowels, and for this condition a second laparotomy was performed. It was found that a large portion of the small intestine had slipped behind the transverse colon in its new vertical position and the pressure exerted resulted in the symptoms. This complication was due to the author's omission to fix the transverse colon to the posterior abdominal wall at the time of operation. All adhesions were divided and the small intestine was relieved of constriction. The remaining excluded portion of the large bowel was at this time resected. The wounds all healed and the patient made a satisfactory recovery, except that occasional dilation through the rectum was required.

In order to avoid **postoperative ventral hernia**, Lewis A. Stimson¹ recommends a combined **transverse and longitudinal incision in the performance of median laparotomy**. The operation consists in a curved transverse incision above the pubes with its concavity upward which includes the skin, aponeurosis, and sheath of the recti, and which is followed by the usual longitudinal separation of these muscles and division of the peritoneum. The author has employed this incision in a large number of operations upon the pelvic viscera and has found it to be perfectly satisfactory. The advantage of the curved incision is that it divides the fascia over the recti in the direction of and not across its fibers.

¹ Med. Rec., June 28, 1902.

Albert Vanderveer¹ deals with the subject of **phlebitis following abdominal operation** and reports 4 cases in which this postoperative complication arose. The first case was a man aged 58, who was operated upon for angioma of the liver. The phlebitis developed on the fourteenth day after operation. The second case was a woman aged 40 who was operated upon for double ovarian cyst. Pain in the leg developed about the twelfth day. The third case was that of a woman aged 44 in whom a hysterectomy for fibroids was performed. The condition in this case developed 15 days after operation. The fourth case was one of appendicitis in a man of 29 years. The symptoms here set in on the fifth day after operation. In none of these cases could any cause for the phlebitis be discovered. All the patients recovered and none of them presented any particular difficulty at the time of operation, nor were there any other postoperative complications. Sepsis was absent in all four cases.

B. G. A. Moynihan² reports 2 cases of **jejunostomy**. In the first case the operation was done for a "leather-bottle stomach" due to cancer. In this case jejunostomy was the only operation possible. The patient died about a month after operation. The second case was that of a man 73 years old whose whole stomach was involved in cancer. The patient was in extremely bad condition. The operation was performed June 2d, and the patient died July 21st. It is stated that jejunostomy may be performed in all those conditions necessitating the formation of an artificial opening for feeding the patient when the stomach is not available.

Cackovie³ advocates the performance of **jejunostomy in certain cases when gastrostomy is indicated but impracticable**; also in cases of gastric carcinoma and in cases of gastric ulcer with frequent hemorrhages in which medicinal treatment has failed. The author compares the statistics of jejunostomy and gastroenterostomy, and states that the mortality from the operations is about the same, but that the duration of life is greater after jejunostomy.

A case of **extreme cicatricial contraction of the stomach produced by the swallowing of hydrochloric acid in which a duodenostomy was performed** is reported by Hartmann.⁴ The patient improved after the operation, but death occurred 2 months later from suppuration of the stomach. Hartmann believes that duodenostomy offers certain advantages over jejunostomy, and it is an operation which can easily be performed because of the mobility of the pylorus and first portion of the duodenum. One of the advantages of the operation is that it produces an opening in the alimentary canal above the point of entrance of the bile and pancreatic juice.

Phocas⁵ reports a case in which he **attached the lower end of the ileum to the transverse colon for the relief of a mucomembranous colitis** which had produced signs of incomplete intestinal obstruction. The patient made an uneventful recovery.

¹ Amer. Med., July 13, 1901.

² Brit. Med. Jour., June 28, 1902.

³ Arch. f. klin. Chir., Bd. LXV, Heft 2.

⁴ Bull. et Mém. de la Soc. de Chir. de Paris, No. 39, 1901.

⁵ Rev. de Chir., Nov., 1901.

Francis W. Murray,¹ of New York, suggests a **surgical means of treating amebic dysentery**. Murray approves of the classification of Councilman and Lafleur, who divide amebic dysentery into : (1) that of moderate severity; (2) gangrenous dysentery; and (3) chronic dysentery. It is only in the last class of cases that Murray recommends the operation of right inguinal colostomy, by means of which the colon is placed entirely at rest and is capable of being thoroughly irrigated. This operation, however, is not recommended in the early stages, but when the disease has existed a number of months in spite of medicinal treatment. Its use should also be confined to those cases in which the disease is limited to the colon. Periods of great improvement, when the patient will apparently be quite well, are characteristic of these chronic cases, many of which terminate in an hepatic abscess which is apt to prove fatal. Medicinal treatment has been of but little use in this condition, as the remedies employed cannot reach the real seat of the disease, which is an extensive ulceration of the submucosa of the large intestine with oftentimes only very small openings through the mucous membrane. Streptococci, which are often associated with the amebas, play an important part in the development and extension of the disease. The ulcerating areas in the submucosa may communicate with one another by tortuous sinuses. The lesions of the mucous membrane appear to be secondary to those of the submucosa. These ulcerations have a tendency to gradually extend, and one of the dangers accompanying the chronic form of this disease is that it may pass into the gangrenous form at any time. When the ulcerating areas are accessible and of limited extent, the administration of drugs and irrigations of the bowel may bring about a cure, but Murray thinks there can be little hope for permanent success unless the diseased bowel is put entirely at rest. The operative treatment suggested should be performed as early as possible after medicinal treatment has failed. If medicinal treatment has been employed for 4 months and the condition has not been cured, it is recommended that an artificial anus be established by means of a right inguinal colostomy. This artificial anus should be kept open for a long time, and closed only when it is quite evident that the ulcerations have healed. A cure can be demonstrated by examining the bowel with Kelly's tubes introduced through the anus and through the wound. When the mesentery of the ascending colon is too short to permit of the formation of a complete artificial anus, or when this portion of the bowel is involved in the ulcerating process, the operation should be performed upon the ileum. This is not a new method of treating ulcerations of the large intestine, but Murray knows of no case in which colostomy has been performed in cases of chronic dysentery. He reports a case upon which he operated 2 years previously in the manner suggested in his paper. The patient, a man of 29, had suffered from amebic dysentery for nearly 2 years, and had undergone during this time careful medicinal treatment in a number of hospitals. Right inguinal colostomy was performed and daily irrigation of the colon was practised. The patient immediately improved, and 3 months after the operation he

¹ Ann. of Surg., May, 1901.

was able, for the first time in more than 2 years, to work at his trade, that of a tailor. Six months after the operation his wound had entirely healed and he was working every day. Unfortunately in this case the patient would not allow Murray to form a complete artificial anus, and therefore he was not able to put the colon entirely at rest. [The case reported illustrates the point made by Murray, and we believe if this operation were performed in those apparently hopeless cases of chronic amebic dysentery the mortality rate of this disease would be greatly diminished.]

MacLaren¹ reports 5 consecutive cases of **intestinal anastomosis** illustrating various methods of suture. The author is an advocate of Connell's method, and believes that it gives better results, both immediate and permanent, than any other method, and that the sutures can be placed almost as quickly as the Murphy button.

The subject of **abdominal contusions associated with rupture of the intestine** is interestingly reviewed by Homer Gage.² He has collected and studied 85 cases occurring since 1887, and compares his conclusions with those reached by Curtis after a study of 116 cases occurring prior to 1887. None of the cases reported by Curtis were operated upon and all terminated fatally. Of the 85 cases collected by Gage, in 75 the injury was the result of direct violence, and in 32 of these it was due to a kick of a horse or man. In 19 cases the injury was produced by a fall and in 6 it was caused by a piece of wood thrown from a circular saw. In but 9 of the 85 cases was the injury produced by a crushing force. Gage is in accord with Curtis, who concluded that the dangerous elements in the production of the injury were the great velocity and the small area of the striking surface of the vulnerating body. When rupture of the intestine occurs from a crush, it is usually associated with severe injury of other viscera. The location of the injury was definitely stated in 78 of the cases: in 10 the duodenum was involved; in 20 the jejunum; in 42 the ileum; and in 6 the large intestine. In 9 cases there was more than one tear in the intestine, and in 1 case there were 6 ruptures and all were successfully closed. The frequency of multiple lesions of the bowel in these cases points clearly to the necessity of making a careful and extensive search. Curtis found accompanying lacerations of the mesentery in 16 % of his cases, while Gage met this complication in only 7 %. In repairing such injuries care must be taken to see that the circulation of the bowel is not interfered with; and if it is, resection is indicated. Without operation such an injury is necessarily fatal, although it is possible, as sometimes takes place in strangulated hernia, for an abscess to form at the seat of rupture and open into another portion of the bowel, thus draining itself and terminating in recovery. Gage, however, has been able to find no such case recorded in literature. Of the 85 cases, 45 were not submitted to operation and all died; 40 were operated upon and 17 recovered. Gage admits that this percentage of recoveries is rather too high, because many fatal cases have probably not been reported. The results obtained by operation, however, are sufficiently satisfactory to

¹ Ann. of Surg., May, 1902.

² Ann. of Surg., Mar., 1902.

warrant surgical interference in all cases. Age is found to be of little significance in making a prognosis. A review of these cases shows that the earlier the operation is performed, the more successful it is likely to be. When severe primary shock exists, it is wise to overcome this before operating. The position of the rupture seems to have little effect upon the prognosis provided proper treatment is promptly instituted. Of the 45 fatal cases, 18 not operated upon died within the first 24 hours. One case is reported in which the patient continued at work for some time after receiving a kick in the abdomen and suffered from no marked symptoms until the next day. He was not operated upon and died 33 hours after the accident. At the autopsy the abdominal cavity was found filled with blood and feces. The most useful symptoms in making a diagnosis of rupture of the intestine from contusion are shock, abdominal pain, vomiting, and rigidity of the abdominal muscles. It is rare, however, to find a case presenting all of these symptoms soon after the accident. Probably the most valuable of the signs mentioned are pain and localized rigidity. Important factors, too, in diagnosing this condition are the nature of the accident, the velocity of the instrument producing it, and the area of its striking surface. The later symptoms which develop in these cases are those of perforative peritonitis. Gage adds 4 new cases, 3 of his own and 1 of S. B. Woodward, all of which were operated upon and one of which recovered. Each of these patients was injured by a piece of board flying from a circular saw. In none of these cases was there severe shock, and, in fact, in less than half of the 35 collected cases shock was not present. The absence of this condition is considered of little importance. Gage would consider a kick or hard blow with a comparatively sharp instrument followed by localized pain and rigidity suggestive of severe intraabdominal injury requiring immediate exploration. Gage says that if, "after taking into consideration the manner in which the injury was inflicted, the amount and nature of the force applied, and the results of a careful physical examination, one is not reasonably certain that there has been no injury to the underlying gut, an exploratory incision should be made and all doubt removed at once." This exploration should be instituted early. When severe primary shock does exist, however, reaction should be obtained by intravenous or subcutaneous injections of salt solution before opening the abdomen. Large enemas of salt solution are objected to because of the tendency they would have to favor fecal extravasation. The abdomen should be opened at the point of injury when this can be definitely located by the appearance of the superficial tissues or by the localized pain and tenderness. Drainage should be employed only when doubt exists as to the efficiency of the intestinal sutures.

Bottomley¹ discusses **abdominal contusions accompanied and unaccompanied by severe intestinal injury**. Particular attention is devoted to a consideration of 20 cases of undoubted severe intestinal injury caused by blunt violence and an equal number of cases of simple contusion of the abdominal wall. After comparing these cases, Bottom-

¹ Boston M. and S. Jour., Dec. 5, 1901.

ley concludes as follows: "To sum up in a few words, it may be said that, at present, we have no certain means of distinguishing between a simple abdominal contusion and one complicated by severe intestinal injury, except through an exploratory incision. This, to be of most avail, must be done within a very short time (3 to 5 hours) after the receipt of the injury. Having no other certain method of diagnosis, and the promptness of the operation being the feature necessary for its success, exploratory laparotomy, combining as it does opportunity for a certain diagnosis and the best possible treatment, if severe injury be present, should be a very early routine measure in all but the most trivial cases of contusion of the abdomen."

R. Harvey Reed¹ presents a paper on **grave abdominal injuries without external evidences of traumatism**, relating a number of cases and reaching the following conclusions: "From reading the literature of this class of cases, together with my own experience, I am led to the conclusion that it is the surgeon's duty to make an exploratory incision in all cases in which there is grave doubt as to the real nature of the injury, and particularly so when the constitutional symptoms point to a condition more serious than is indicated by either the subjective or objective symptoms, provided the physical condition of the patient is such as to warrant an operative procedure."

An interesting case of **traumatic rupture of the mesenteric arteries** is reported by Aldrich.² The patient was a man aged 53, who in falling upon a hard pavement fractured both bones of his leg. The man did well for the first few days after the accident, except that he was very weak. He then developed symptoms of internal hemorrhage the location of which could not be definitely fixed. On the seventh day the patient died with slight distention of the abdomen and no localized dulness or undue resonance. At the autopsy the thoracic organs were found in fairly good condition and the fractured bones in excellent shape. The abdomen, however, contained quite a quantity of blood which had escaped from ruptured mesenteric vessels. The mesentery contained large quantities of fat, and it is thought that the jar produced by the fall, together with the weight of the mesentery, resulted in its rupture.

An instructive case of **traumatic rupture of the intestine** is reported by Frederick T. Wright.³ The patient was a man aged 57 years who spoke little English. The history obtained shortly after the accident was that the patient had fallen across a railroad rail and struck his back. The fact that all his symptoms were referred to his back confirmed this history. It was, however, subsequently learned that the patient had fallen into a hole and struck upon his abdomen. There was at first very little to indicate abdominal injury. Symptoms of peritonitis with obstruction of the bowels, however, were well marked on the fourth day after the injury, and operation was performed, revealing a general peritonitis with a small abscess-cavity connected with a long rent in the small bowel. The case is instructive in the fact that it shows the

¹ Jour. Am. Med. Assoc., May 17, 1902.

² Ann. of Surg., Mar., 1902.

³ N. Y. Med. Jour., July 20, 1901.

necessity for a careful history in all cases of injury about the abdomen, and also in the fact that an extensive lesion may be present and produce very few symptoms. Although this patient was seen by a number of physicians, and a diagnosis of obstruction with peritonitis was made, no one supposed that a perforation was present. The patient died shortly after the operation.

Livingston¹ reports a case of **rupture of the jejunum from direct violence without external bruising**. The patient was a boy who had been "run over" by a horse. Except for the temporary shock, there were no marked symptoms in this case until the day following the injury, though soon after the accident abdominal injury was thought of and consultation held. "Five and a half hours after the accident the boy was smiling, free from pain, and moving easily and freely in the bed." The abdominal walls moved freely with respiration and there was no particular tenderness even on the day following the injury. By this time, however, vomiting had occurred, and the patient had a very rapid pulse and complained of general abdominal pain. Symptoms of peritonitis suddenly set in at the beginning of the third day. Operation was determined upon and an anesthetic given, but the child's condition became so bad that the operation was not carried out. The necropsy disclosed one or two pints of bloody fluid in the abdominal cavity, inflamed peritoneum with pus under the transverse mesocolon, and a rent in the jejunum near its commencement about $1\frac{1}{2}$ inches long at the free border of the bowel.

Penetrating gunshot wounds of the abdomen are made the subject of a clinical lecture by LeConte² at the Pennsylvania Hospital. The patient who formed the basis of LeConte's remarks was a colored man 27 years of age who had received a gunshot wound which had effected an entrance 4 inches to the right of the first lumbar spine and on a level with the crest of the ilium. No wound of exit could be found. The abdomen was distended, tympanitic in front, dull in the flanks, and universally tender. Exploration of the wound showed that it penetrated the abdominal cavity. When this was discovered, the patient was placed upon his back and the abdomen opened after establishing drainage of the posterior wound. When the peritoneum was opened, blood gushed from the wound. The entire small intestine was then withdrawn from the abdominal cavity and inspection revealed a perforation of the small intestine and also one of the transverse colon. The bleeding, however, was found to originate from a large mesenteric vessel which had been injured. These wounds were repaired and salt solution irrigation used freely. The abdominal cavity was drained. During the operation 5 pints of hot salt solution were introduced into the median cephalic vein. The bullet was not found, but was supposed to be lodged somewhere in the anterior abdominal wall. In discussing the subject of gunshot injuries of the abdomen, LeConte mentions the importance of an examination of the urine immediately after the accident to observe whether blood is present, which would indicate an injury of the urinary tract. Military surgeons have found that penetrating wounds of the abdomen produced by the

¹ Brit. Med. Jour., Mar. 1, 1902.

Amer. Jour. Med. Sci., Dec., 1901.

small steel bullet of high velocity do better when the abdomen is not opened and conservative treatment is instituted. This fact, LeConte points out, is due to the circumstances under which operations in the field are performed, and he takes the stand that every case of penetrating gunshot wound of the abdomen, whether produced by a leaden bullet or by the modern bullet of warfare, should be promptly explored if it is possible to perform the operation with proper modern conveniences for aseptic surgery. The question of operating in the presence of shock is next considered, and here the writer takes the view that in all probability the shock is the result of hemorrhage, and that until this be controlled no reaction will take place. Occasionally profound shock does occur where little hemorrhage is present, but this is not the rule. An anesthetic in the presence of shock is of course dangerous, but not to be compared with the results of intraabdominal hemorrhage and an infection of the peritoneum. The surgeon should not take for granted that the abdominal cavity has been opened because of the apparent course the bullet has taken or because of the abdominal symptoms presented, since occasionally abdominal tenderness, distention, muscular rigidity, and shock may be present when the abdominal cavity has not been opened. These remarks are illustrated by reference to a very stout patient who presented all these symptoms, and yet in whom the abdominal cavity had not been injured, the bullet entering at a point on a level with the left anterior superior spine of the ilium and $2\frac{1}{2}$ inches to its inner side. Apparently the bullet had gone directly inward. Exploration of the wound, however, in the presence of marked abdominal symptoms showed that the bullet had ranged downward and had penetrated to, but had not entered, the peritoneum. Exploration of the wound should always be made even if the abdominal incision is not made at this point. LeConte makes a strong point of showing the necessity in these emergency cases of thoroughly cleansing the skin before opening the abdominal cavity. At least 15 minutes should be devoted to cleansing the field of operation. He refers to a patient in whom, after a rapid and ineffectual scrubbing of the abdomen, the cavity was opened for a perforating wound of the liver. The hemorrhage from the liver was controlled by packing, and the patient did well for several days, but subsequently died from septic peritonitis, and a careful postmortem examination showed the liver wound to be aseptic while the infection could be traced from the skin of the abdominal wound. The ball entered at the back in this case. The abdomen should be opened after a careful consideration of the position of entry and the course the bullet has taken. The author prefers the median line, the semi-lunar line, and the costal border as the best positions for opening the abdomen for exploration. As soon as the abdomen is opened the surgeon should devote himself to the control of the hemorrhage, and this is best accomplished by withdrawing the entire small intestine from the abdominal cavity and covering it with hot towels or gauze. The blood is then removed from the peritoneum and the source of hemorrhage discovered. When there has been no injury to the solid viscera, the most frequent source of hemorrhage is the mesentery. Hemorrhage from the mesentery

can be controlled by suture or ligature, and that from the solid viscera by packing, although occasionally it may be necessary to remove the spleen or kidney. After controlling the hemorrhage perforations of the alimentary tract should be sought for, and this is best done by beginning with the stomach and following the windings of the small intestine throughout. The practice of inflating the intestine with hydrogen gas introduced into the rectum is heartily condemned: "It wastes time, it increases fecal extravasation, and so distends the intestines that it may be impossible to return them to the abdominal cavity until they have been emptied of gas." With a free incision and a systematic search perforations will not be overlooked. When the bowel is found to be injured at two points to such a degree as to require resection, it is better to remove the intervening healthy bowel than to make two resections, provided the intervening healthy portion is not more than 30 to 40 inches long. If the anterior wall of the stomach is perforated, it should be closed and the posterior wall of the stomach then carefully examined through an opening made in the gastrocolic omentum. An examination of the posterior wall should not be made through the anterior wound. After repairing all intra-abdominal damage, the cavity and the intestines should be thoroughly irrigated with warm salt solution and as much of this solution as possible allowed to remain within the peritoneum. If the bullet is not encountered during the examination or repair of the abdominal organs, it should not be searched for, but allowed to remain until a later period, when it can be located by the x-ray. It will probably be found in the muscular wall of the abdomen or in the bone, and can be removed. Drainage of the abdominal cavity is advised after these operations, and if the lesser peritoneal cavity has been involved it is thought that a counteropening should be made in the flank. Too much time should not be devoted to closing the wound, as the patient is in all probability suffering from considerable shock. The author's conclusions are as follows: "(1) Remove the patient at once to the nearest place where a clean operation may be undertaken. (2) Assure yourself positively that penetration has taken place. (3) Having demonstrated this fact, always open the abdomen and search for injuries, and make this search systematic. (4) Never wait for symptoms to tell you that profuse hemorrhage or intestinal perforation has taken place, for by that time operation will usually be useless." [We concur with LeConte's views regarding the necessity in civil practice for prompt exploration in all cases of penetrating wounds of the abdomen regardless of symptoms, provided the proper environment for aseptic work exists.]

A report of **6 cases of penetrating wound of the abdomen**, together with a table of 152 cases operated upon at the Charity Hospital, New Orleans, is made by E. D. Fenner.¹ The cases in the table include all of those operated upon at the hospital between January, 1892, and January, 1901. It is the rule at the Charity Hospital to operate upon all cases as soon as possible when penetration of the abdominal cavity has occurred, "except when in the upper thoracic belt it appears that, on the left side,

¹ Ann. of Surg., Jan., 1902.

the viscera have escaped injury, and, upon the right, when only the liver has been injured. These cases we generally let alone unless there is evidence of severe internal hemorrhage, when under suitable conditions an attempt would be made to get at the bleeding point and secure hemostasis by suture or packing." The length of time which has elapsed since the receipt of the injury also influences the treatment, as Fenner believes that operative interference after 24 hours is useless. In all penetrating wounds of the abdomen with visceral injury a prognosis is most difficult. The postmortem examinations made at the Charity Hospital have shown many cases similar to that of the late President McKinley—that is, little or no peritonitis, but gangrenous areas about the lesions in the bowels apparently due to contusion. Patients suffering from such injuries had usually survived several days, often with little or no distention or vomiting, but with slightly elevated temperature and always with an anxious expression and a rapid pulse. Of the 6 cases operated upon by Fenner, 2 presented no visceral lesion and recovered without complication. One of the cases, that of a colored boy 16 years of age, is of particular interest, as the patient recovered after a gunshot wound producing three perforations of the colon and a grazed wound of the stomach. The portion of the bowel injured was the descending colon near the splenic flexure. The bullet in this case entered in the lumbar region and after injury of the stomach ranged upward and was not found. Food was withheld from this patient until the fourth day; the bowels moved on the sixth day, and on the eighth and eleventh days the patient suffered from the loss of a considerable quantity of arterial blood by the bowel. He made, however, a good recovery. Two other cases are worthy of note, since the bullet entered through the right buttock in one, and just above the greater trochanter in the other. In the first case, the bullet after entering the abdomen perforated the bowel and also the bladder. Except for a chill and fever on the third and fourth days, due to frequent catheterization, the patient made a good recovery. In the second case, which also recovered, there were 8 perforations of the ileum. In this case the bowels were not moved until the fourteenth day after operation. The sixth case is interesting as it presented a penetrating wound of the thorax with wounds of the diaphragm, spleen, stomach, and liver. The spleen was removed and the diaphragm, stomach, and liver sutured. The wound of the stomach involved only the serous and muscular coats. The ball in this case was found in the folds of the gastrocolic omentum. On the seventh day after operation the patient was suffering from a pneumothorax and pleurisy on the side of the injury and a pneumonia on the opposite side. These conditions, however, subsided promptly and the patient made a rapid recovery. All of the 6 cases recovered. Of the 152 cases operated upon at the Charity Hospital within the dates given, there were 87 deaths, a mortality of 57.23%; 113 of these operations were for gunshot wounds with 78 deaths, or a mortality of 69%; 39 were for stab wounds with 9 deaths, a mortality of 23.07%. The mortality rate in a series of 110 cases reported by Morton in 1889 was 62%, and of 165 cases reported by Coley in 1890 the death-

rate was 67 %. It is true that the mortality rate in cases of penetrating wounds of the abdomen with visceral injury is high, but it should not discourage operation, because clearly the cases which do recover would die without operation. Fenner has been impressed with the fact that it is impossible to tell from the general symptoms or external appearances whether or not the viscera have been injured, and therefore exploratory operation is urged in all cases of penetrating wounds of the abdomen. A most thorough search of the entire intestinal canal and of the other viscera is necessary in order to exclude the possibility of injury. A case is recalled in which the operator opened the abdomen upon slight indication, examined 3 or 4 feet of bowel, and, finding no injury, closed the abdomen. The patient died 2 days later with a violent peritonitis, and the autopsy revealed an incised wound through the bowel just beyond the point at which inspection had ceased.

A careful review and discussion of the question of **gunshot wounds of the abdomen** is made by Mohr.¹ The author reviews critically the various statistics accumulated during the recent wars and compares the opinions of the various writers and the different mortality rates. All surgeons are agreed upon the necessity of operative interference when symptoms of hemorrhage are present or when intestinal injury is certain, but there is considerable difference of opinion about the time when operation should be undertaken. The indications for operative interference in war are more limited than in times of peace. Mohr expresses the opinion that the presence of suppurative peritonitis should be considered an indication on the battlefield as well as in civil practice. During war penetrating wounds from small-caliber bullets apparently present a little better mortality when the expectant treatment is employed. Even the mortality when early operation is done is no better than that which follows the expectant treatment under these circumstances, but Mohr believes that the improved technic and the greater tendency toward early operation in future years will show much improvement in the mortality following operative interference. Reference is made to 48 cases of penetrating gunshot wounds of the abdomen observed within recent years and operated upon within 4 or 5 hours, in which the mortality rate was only 14.5 %, only one-third as great as the best mortality rate obtained without operation.

August Schachner² presents a paper on **foreign bodies accidentally left in the abdominal cavity**, with a report of 155 cases. The subject is gone over very thoroughly, numbers of brief reports of cases being incorporated. The author concludes that the recorded cases do not truly represent the frequency with which this accident occurs; that if the foreign body is an aseptic one, an attempt at encapsulation is made; that when nature attempts to expel the foreign body the exit is made through the point of least resistance, usually by way of the alimentary tract or an imperfectly united wound; that foreign bodies may remain quiescent for years in the abdominal cavity; that the disturbance which a foreign body

¹ Arch. f. klin. Chir., vol. LXIII, Nos. 1 and 2.

² Ann. of Surg., vol. XXXIV, 1901, pp. 499 and 678.

will produce is dependent upon a number of conditions, such as its shape, the point of location, behavior of the patient, etc.; that no symptoms may be set up or abdominal disturbance of the most violent character may be caused; that not infrequently the symptoms suggest a slow form of sepsis or an ileus; that notwithstanding the fact that careful counting before and after operation will in most instances prevent the accident, yet it has occurred when the count has been made by more than one person; that the same may be said of the plan of having tapes attached to the abdominal pads and fixed with forceps; that another precautionary measure worthy of trial is the restriction to a limited number of instruments and pads; and that the responsibility of counting should rest with an assistant or a nurse. Schachner thinks that the most careful recognition of system, simplicity, and watchfulness should at all times be practised in abdominal surgery. The accident not infrequently occurs when sufficient time for preparation for the operation has not been allowed.

Lambotte¹ deals at length with the subject of the **surgical treatment of enteroptosis**, and reports 4 cases upon which he has operated, the first being done in October, 1895. In most cases the attachment of the splenic and hepatic flexures of the colon are elongated, and sometimes, in addition to the falling of the bowel, there is noticed a venous engorgement of the most dependent portion of the mesentery. In the cases reported Lambotte attached the splenic and hepatic flexures of the colon to the abdominal wall. The four patients have remained well for from 2 to 4 years since operation.

Maylard² reports 2 cases of **postoperative thrombosis of the mesenteric vessels** followed by death. In the first case death occurred 4 days after the performance of a gastrojejunostomy for pyloric obstruction, and in the second case 3 days after removal of the thyroid gland for exophthalmic goiter. These cases presented many points of similarity. One patient was 26 years of age and the other 28; in both there was a ventricular systolic murmur and a rapid pulse before operation with increased rapidity after operation; in both there was great excitability on the second and third days after operation, although the patients were in different institutions; in both there was pain in the lower portion of the abdomen suggesting peritonitis; in both the mesenteric vessels connected with the ileum were the ones found thrombosed; and in both the operation wounds were found perfectly healed. In the pyloric case flatus was passed, though there was no fluid bowel movement. In the goiter case there was the passage of fluid stools containing blood. In the pyloric case 3 feet of the ileum was involved; in the goiter case the whole ileum was involved and the bowel presented marked evidences of beginning gangrene. In discussing this condition, Maylard says that an embolus plugging the main trunk of the inferior or superior mesenteric artery will produce symptoms of a much more acute and distinct character than those arising from an obstruction of only a branch of these vessels. Obstruction to the arterial circulation also produces more acute symptoms than an obstruction to the

¹ Presse Med. Belge, 1901, Nos. 24, 25, and 26.

² Brit. Med. Jour., Nov. 16, 1901.

venous circulation. The following symptoms are considered indicative of thrombosis of the mesenteric vessels when occurring after an operation: "(1) The onset of intraabdominal pain, gradual or acute, but more or less constant, and positively of a colicky character. (2) Neither tenderness on palpation of the abdomen, nor distention nor rigidity of the parietes in the earlier stages. (3) Possibly diarrhea with or without blood. (4) Possibly vomiting, but not of the usually acute obstructive character. (5) Rapidity of pulse. (6) Undue and inexplicable restlessness and excitability. (7) Any pre-existing symptoms of cardiac or vascular disease may be considered to attach additional weight to the significance of the other symptoms."

Eugene A. Smith¹ reports a case of **carcinoma of the cecum** and one of **rupture of the sigmoid treated by intestinal anastomosis**. The rupture of the sigmoid occurred during the removal of a pyosalpinx. In both cases the author closed the distal end of the bowel by invagination and anastomosed the proximal end to the side of the distal portion. He believes that this method is preferable to an end-to-end anastomosis because a better circulation is insured for each end of the bowel and because each cut edge of the mesentery is free to recover its circulation, eliminating the so-called "dead space" at the mesenteric border which leads to leakage in end-to-end anastomosis. The circulation of the parts anastomosed is also said to be better. It is thought, too, that the strain of peristalsis is less than in an end-to-end coaptation. It is a method strongly recommended in resection of the sigmoid and cecum and in any case of resection of the bowel where the circulation is dubious at the site of resection.

Jopson and White² present a complete consideration of **sarcoma of the large intestine**, reporting a case of their own in which no operation could be performed because of an intercurrent acute illness from which the patient died, and presenting a table of 22 cases. Without operation death is practically certain. No case has been reported in which Coley's fluid has resulted in a recovery. Operation offers the only chance of recovery, and should be employed in cases seen early and in doubtful cases. Of the 22 cases collected, 14 were operated upon; in 4 no attempt was made to remove the tumor; in 10 resection was practised, 5 dying as the result of the operation. Of the remaining 5, one died 47 days later of recurrence; of the remaining 4, one was living at the end of 6 months, one at the end of 7 months, and one at the end of 3 years after operation. In the last case, although the patient was living at the time of the report, the date of the operation is not given. In 4 of these 5 cases enlarged mesenteric glands were removed, which fact shows that glandular metastasis is no contraindication to operation.

The subject of **general enteroptosis** is thoroughly considered by Robert T. Morris,³ who devotes particular attention to the operative treatment of this condition. The principal cause of general enteroptosis the author believes to be the wearing of corsets. Many of the patients

¹ Amer. Med., May 10, 1902.

² Am. Jour. Med. Sci., Dec., 1901.

³ Med. News, June 28, 1902.

can be relieved of symptoms by a corset which supports the hollow viscera and by massage and electricity properly and persistently applied to the abdominal muscles. Morris believes that the operation proposed by Webster, which consists in exposing the separated margins of the recti muscles and bringing them together without opening the peritoneum, is not to be preferred to an operation which he practises, and which consists not only in approximating the recti, but in removing the redundant peritoneum and transversalis fascia and also shortening the falciform and suspensory ligaments of the liver after scarifying them. It is also the author's custom frequently to irritate the upper surface of the liver and under surface of the diaphragm so as to cause adhesion between the two surfaces. In 2 cases Morris has at the same time operated for loose kidney. He has felt inclined in these cases to gather up the lax gastrohepatic omentum, but because of the important structures in this locality he has considered it best to resort to other measures.

RECTUM AND ANUS.

Rushmore¹ reports a case of a man 39 years of age in which he practised the operation of **anorectal transplantation for paralysis of the sphincter ani**. The condition of the patient was the result of an injury received 5 months before admission. The injury was caused by the penetration of a steer's horn into the rectum, inflicting a lacerated wound of the sphincter. Before the patient came into the hands of Rushmore he had been subjected to 6 operations—2 in Chicago, 2 in Boston, and 2 in New York. The last operation, which the patient described as "twisting the lower part of the rectum and stitching it fast in its twisted position," gave him some relief except when he suffered from an attack of diarrhea. At the time of admission he was thin, pale, slept badly, and was altogether a nervous wreck. The anus was surrounded by firm scars and the sphincter manifested no contractile power whatever when the finger was inserted into the rectum, nor could the patient contract the muscle to the slightest degree by voluntary effort. An incision was made around the anus and extended back to the sacrococcygeal articulation; the coccyx was removed and the rectum was separated from its surroundings on all sides. The anal end of the rectum was then firmly fixed with silk sutures into the upper angle of the wound just below the sacrum and the wound below the upturned rectum was sutured. This portion of the wound later became infected, but ultimately healed. The patient began to experience benefit immediately after the operation. When he left the hospital, he was having 2 evacuations early in the morning and none afterward; 2 months after he left the hospital he showed a great gain in flesh and strength and was apparently perfectly well. An examination of the rectum showed at the upper portion of the bowel, just within the anus, a valve caused by the folding of the bowel-wall. Below the anal opening there was a pouch of considerable size which has shown a tendency to increase rather than diminish.

¹ Ann. of Surg., Nov., 1901.

There was no irritation of the bladder. The patient's bowels moved once or twice in the morning only. The case involves several questions which only time can answer. One is, What will become of the valve-like formation due to the folding of the bowel? and another, What changes will take place in the pouch below the opening? At the time of the operation Rushmore had some fear as to the effect of traction upon the bladder, and also some anxiety regarding the blood-supply of the lower portion of the bowel, but from neither of these possible sources did there develop any trouble.

Bullard¹ strongly condemns the **treatment of internal hemorrhoids by the injection method**, and also opposes strenuously the Whitehead operation. Besides being unscientific and ineffectual, the injection method frequently produces abscess-formation which may lead to extensive suppuration or to the establishment of a fistula. It cannot, however, except in rare cases, be considered dangerous to life. It is difficult to get primary healing in the Whitehead operation, and when such satisfactory results can be obtained by less formidable procedures this operation should not be employed. The operations of ligation and of the clamp and cautery, when properly performed, give perfectly satisfactory results and are accompanied by little immediate danger or subsequent complication. The cautery possesses the advantage of producing no vesical tenesmus and of being a more speedy and painless method. The author has never seen a recurrence after the clamp and cautery operation.

W. B. Davis² discusses the hemorrhoidal circulation with special reference to **the prevention of postoperative bleeding in operations on hemorrhoids**. This bleeding is usually of venous origin and is the result of pressure upon the veins by a muscle which has not been thoroughly divulsed. The author believes that instead of tamponing the rectum for postoperative bleeding the thorough divulsion of the sphincter will be found sufficient to arrest the hemorrhage. Should the bleeding be arterial, the divulsion of the sphincter exposes the bleeding point and enables the operator to catch it with a hemostat and apply a ligature.

George W. Gay,³ who is an advocate of the **carbolic injection in certain forms of hemorrhoids**, reaches the following conclusions: "(1) Inject only internal piles; (2) the solution of carbolic acid should not exceed 10%; (3) do not repeat the operation under a week; (4) inject only 1 or 2 minims into each tumor; (5) inject not more than 2 piles at any one time; (6) promise relief only and not a radical or permanent cure."

An original method of **operating upon hemorrhoids** is suggested by J. Rawson Pennington.⁴ It consists in eversion of the pile-bearing area and the removal of an elliptic piece of mucous membrane from each hemorrhoid; after that, the complete removal of the tumor by dissection. After the patient has been prepared in the usual way, with a laxative and an enema, the sphincter is dilated and the rectum irrigated with a mer-

Med. Rec., Mar. 29, 1902.

² Amer. Med., Aug. 17, 1901.

³ Boston M. and S. Jour., Dec. 5, 1901.

⁴ Jour. Am. Med. Assoc., Dec. 21, 1901.

curic chlorid solution of 1:3000, followed by normal salt solution. A number of T-shaped forceps applied to the muco-cutaneous juncture are employed for eversion by traction of the hemorrhoids. A stream of hot normal salt solution is allowed to flow over the wound during the removal of the hemorrhoids through the elliptic incision. Any spurting vessels are caught with hemostats and twisted, the author never having found it necessary to apply a ligature. The mucous membrane collapses and covers the denuded surface after the removal of the tumor. In the operation care should be taken not to cut the skin surface, since it renders the postoperative stage much more painful. After the completion of the operation a gauze tampon covered with rubber is introduced into the anus, and this is removed at the end of 48 hours and the bowels are opened. Pennington has employed this method in 138 cases, in 29 of which local anesthesia was used. A number of cuts illustrate his article.

A case in which a man 60 years of age **forced into his rectum a gallipot** measuring $2\frac{1}{2}$ inches in diameter and $2\frac{3}{4}$ inches in height is reported by Marmaduke Sheild.¹ The patient, in making frantic efforts to remove it, only managed to remove some pieces which he had broken off. The foreign body was so large and its edges so dangerous that Sheild decided to remove it through an incision of the rectum. A free incision was therefore made into the rectum from behind and the foreign body removed with a pair of obstetric forceps. The wound, which closed, had subsequently to be opened because of septic infection. The author refers to a number of interesting cases of a like nature which have been reported.

Lewis H. Adler² reports an interesting case of a machinist 60 years of age from whose rectum he removed a foreign body which consisted of the **handle and valve of a steam-radiator pipe**. The diameter of the smaller end was $1\frac{1}{2}$ inches, and of the larger $2\frac{1}{2}$ inches, and the long axis of the body was $2\frac{1}{2}$ inches. The patient's family physician stated that the patient had in his possession a large hook about 2 feet long, made of $\frac{1}{4}$ -inch galvanized wire, with which he was in the habit of extracting the foreign body after introducing it.

A case of **perforation of the rectum into the peritoneal cavity** which was operated upon successfully is reported by Turner.³ The patient was a boy 17 years of age. The perforation was caused by a broomstick over which the patient was endeavoring to vault. The posterior portion of the anus and the lower part of the rectum posteriorly were torn, and also an opening could be felt in the anterior wall of the rectum higher up. Laparotomy was performed and a transverse rent $2\frac{1}{2}$ inches long was found in the peritoneum between the bladder and the rectum. The opening into the bowel was closed with catgut sutures and the parts were sponged and washed. A glass drain surrounded with gauze was introduced into the abdominal wound. A larger tube was introduced into the rectum beyond the tear of the bowel. Five days after the operation all of the gauze and the glass drain had been withdrawn and a smaller rubber tube had been substituted. A little flatus was passed by the abdominal

¹ Lancet, Oct. 12, 1901.

² Amer. Med., July 20, 1901.

³ Lancet, May 24, 1902.

wound 9 days after the operation; 13 days after the operation both the rectal and abdominal drainage-tubes were removed; on the fourteenth day a small amount of fecal matter passed through the abdominal wound; on the sixteenth day more fecal matter passed in this way, but a normal movement was also passed by the anus. Fecal discharge through the wound gradually lessened and the patient made a perfectly satisfactory recovery.

Thos. C. Martin¹ defends his position regarding the **rectal valve and obstipation**, which was severely criticized by Bodenhamer in the "New York Medical Journal" of December 28, 1901. The accompanying illustration is produced to refute the statement of Bodenhamer that there are no rectal valves. Martin records 6 cases in which with the proctoscope he was able to show definitely that the obstipation was due to the formation of valves which obstructed the passage of fecal matter. In each of these cases the division of the valves, or the so-called operation of valvot-

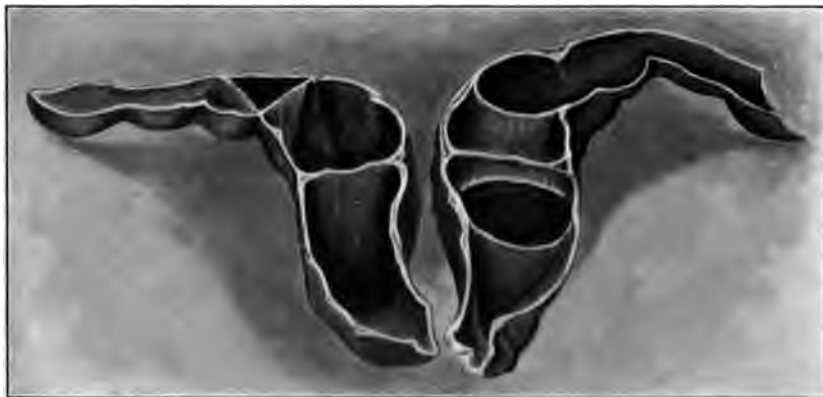


Fig. 17.—The rectum, after being filled with melted paraffin and hardened, was varnished and cut longitudinally into halves, the wax removed, and the drawing made (Martin, in N. Y. Med. Jour. Mar. 8, 1902).

omy, was performed with the most satisfactory results. This condition of congenital valvular obstipation is by no means uncommon.

An **improved method of treating high-seated cancers of the rectum** is described by Robt. F. Weir.² For cancers so situated the Kraske operation is very unsatisfactory, the wound being deep and the difficulty of drawing down the upper portion of the bowel and of suturing the anal portion to the proximal end being great. The operation suggested by Weir is a modification of the Maunsell operation. The abdomen is opened and the bowel freed nearly to the tip of the coccyx behind, and to the edge of the prostate in front. The bowel is divided between two iodoform tapes which are tied around it. The lower end of the rectum is then inverted and drawn out of the anus, and after resection of the malignant portion of the proximal end of the bowel is drawn down through the inverted rectum and the edges of the two segments sutured.

¹ N. Y. Med. Jour., Mar. 8, 1902.

² Jour. Am. Med. Assoc., Sept. 28, 1901.

The general peritoneal cavity and pelvic cavity are then separated by suturing the divided portion of the peritoneum. Drainage of the lower cavity is established through an incision behind the anus which permits of the introduction of a tube between the rectum and the coccyx. Weir has performed this operation 3 times, 2 of the patients recovering and 1 dying from the persistent diarrhea.

Matthew D. Mann¹ reports a **new operation for the removal of cancer of the rectum**. The operation described is applicable to those cases where the growth is situated too high up to be reached through the

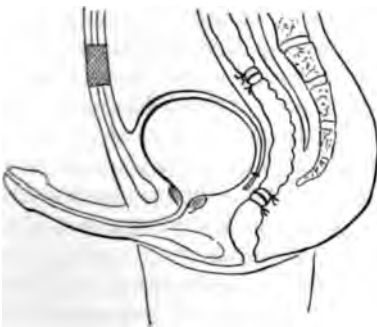


Fig. 18.—Tying off the tumor through an abdominal incision after separating peritoneum from sacrum and bladder (Weir, in Jour. Am. Med. Assoc., Sept. 28, 1901).

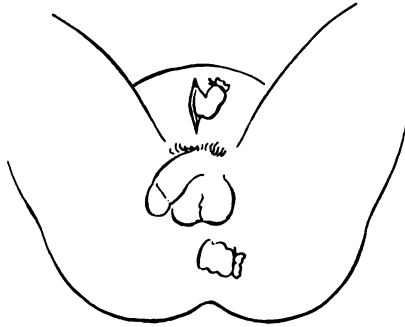


Fig. 19.—Lower end of rectum everted through the anus and the upper end of bowel drawn out of the abdominal cavity (Weir, in Jour. Am. Med. Assoc., Sept. 28, 1901).

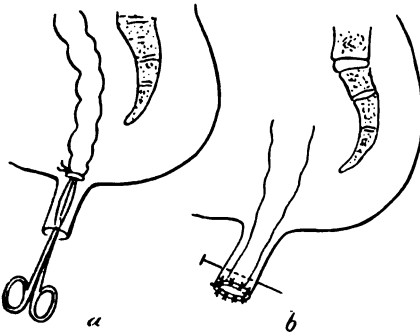


Fig. 20.—a, The upper bowel drawn out through the everted lower end of rectum; b, the ends of the two portions of the rectum sewn together (Weir, in Jour. Am. Med. Assoc., Sept. 28, 1901).

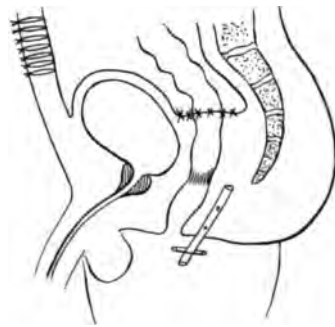


Fig. 21.—The united bowel replaced with posterior drainage and the divided peritoneum so sewn together as to shut off the general peritoneal cavity from the pelvis (Weir, in Jour. Am. Med. Assoc., Sept. 28, 1901).

vagina. It consists in a resection of the diseased portion of the bowel and an anastomosis by means of the Murphy button. The technic of the operation is greatly facilitated by the Trendelenburg position, and Mann has been surprised with the ease with which the resection and anastomosis can be accomplished.

Krusen² reports 2 cases of **cancer of the rectum** occurring in women in which he was able to perform satisfactorily Murphy's operation of

¹ Jour. Am. Med. Assoc., July 6, 1901.

² Amer. Med., May 10, 1902.

resection of the bowel by the vagina. In each case little difficulty was encountered in approximating the proximal and distal portions of the bowel.

A statistical article which presents a review of the recent literature upon the subject of **sacral extirpation for the relief of cancer of the rectum** is presented by Hupp.¹

An unusual case of **rectovesical fistula** is reported by E. Mansel Sympton.² The interesting points in this case are the age of the child, 3½ years, the complete absence of any satisfactory cause for the fistula, and the fact that the fistula allowed free access of the rectal contents into the bladder but did not permit the urine to pass into the rectum. For the relief of this condition a left inguinal colostomy was performed which resulted in the apparent closure of the fistula. About 18 months after the performance of the first operation an attempt was made to close the artificial anus; this, however, failed. A month later a second operation was undertaken, and at this time a constriction of the sigmoid flexure was found which prevented the fecal matter passing down into the rectum. A resection was done and an anastomosis performed by means of a Murphy button. The patient died soon after the operation.

After discussing **rectocolitis**, Wm. H. Beach³ reaches the following conclusions: "(1) Rectocolitis is a condition of the rectum and colon of varying degrees of inflammation. (2) A knowledge of the anatomic bearings of the rectum and colon is necessary to understand the symptoms and reflexes. (3) The symptoms are local and systemic. (4) Rectocolitis may be catarrhal or ulcerative. (5) It may be acute or chronic. (6) When dependent upon polypus, hemorrhoids, fistula, etc., the cure depends upon their removal. (7) Chronic rectocolitis due to altered secretions, anemia, and congenital narrowing of the sigmoid strait, is difficult to cure."

APPENDICITIS.

Maurice H. Richardson⁴ presents some interesting remarks on the **diagnosis between acute appendicitis and some atypical cases of typhoid fever**. As a basis for this paper Richardson takes 5 cases which have recently come under his care. Fortunately, operations in the initial stages of typhoid fever are, as a rule, well borne, and it is in the early stages of the disease that it may resemble appendicitis. There is a strong possibility of mistaking a case of typhoid fever, in which abdominal pain is a conspicuous feature of the onset, for an acute appendicitis. The consequences of such an error are so humiliating that the surgeon may commit the error of hesitating and losing valuable time, or he may fall into the opposite error of hastily intervening. Richardson details 5 cases in which a differential diagnosis between these two conditions was extremely difficult. When there is an acute inflammatory condition of the peritoneum, the most valuable symptoms presented are pain, tenderness, muscular rigidity, and fever. The absence of any one of these

¹ Med. News, Sept. 28, 1901.

³ Med. News, Dec. 14, 1901.

² Quarterly Med. Jour., Nov., 1901.

⁴ Boston M. and S. Jour., Jan. 9, 1902.

symptoms, but particularly the first three, must be accounted for by the surgeon before operation is undertaken. "Without pain at some time in the course of the disease, there can be no acute surgical lesion of the abdomen; high temperature with pain, but without rigidity or tenderness, means simple continued or typhoid fever; very high temperature should excite suspicion if pain and tenderness are present but not marked, for acute appendicitis has usually a moderate temperature; a soft abdomen with a high temperature is a suspicious combination, even if there is pain and tenderness; when typhoid is suspected, the pain and tenderness must be distinctly localized in the appendix, and confirmed by rigidity, resistance, or tumor, before operation for appendicitis is justifiable. When there is doubt as to typhoid, the operation should be postponed if constitutional signs are severe, and local ones hard of detection. When the abdominal symptoms—pain, tenderness, rigidity, with or without distention—call loudly for operation, the abdomen must be opened in spite of the possibilities of typhoid; but cases suggesting typhoid as strongly as appendicitis, should, until the diagnosis is perfectly clear, be carefully observed." It is the surgeon's duty in all cases where there is the slightest doubt to make the most careful and thorough examination of all the symptoms, both local and general, and to give each due consideration. The examination of the blood will be found a great aid to diagnosis, a low leukocyte count indicating typhoid fever, and a high one appendicitis. [A case of appendicitis closely resembling typhoid fever was admitted to the Pennsylvania Hospital and operated upon by Gibbon. The patient was a child who gave a typical history of the prodromic period of typhoid fever and also presented many of the symptoms of this condition. One of the medical staff carefully examined the patient, but no definite diagnosis could be made. A blood-count was made, and a leukocytosis of 33,000 found. This was considered an indication for operation, and a gangrenous appendix with a localized abscess was found.]

A differential diagnosis between appendicitis and typhoid fever is interestingly dealt with by Mühsam,¹ who presents the history of a patient in whom the differential diagnosis between these two conditions was extremely difficult. The patient was taken ill on May 4th, with a rigor which was followed by pain in the appendix region with complete intestinal obstruction. Four days later the bowels were moved by the use of salines. Obstruction occurred again, and was accompanied by vomiting and an increase of pain. On the 11th of May the patient was admitted to the hospital with a temperature of 100.8° F. and with a markedly painful and tender area in the right iliac region. An enema was given and a constipated movement of the bowels was obtained. Following the use of the enema the pain became much worse and the tenderness greatly increased; the patient became restless and the temperature rose to 103° F. At this time the spleen was not enlarged nor were there any rose spots. Mühsam operated on the day of admission, believing the patient to be suffering from a perforated appendiceal abscess. The appendix was found normal except for some adhesions at its tip. A large typhoid

¹ Deut. med. Woch., Aug. 8, 1901.

ulcer in the cecum was found, with considerable ecchymosis of blood about it and a very thin base. The ulcer was inverted by two rows of sutures. The patient recovered from the operation. Three days later the spleen became palpable and 6 days later a few rose spots were seen. On the eleventh day after operation the Widal reaction was obtained for the first time. The fever ran an uneventful course, reaching the normal on June 12th. Reference is made to a case of Rendu in which a similar mistake was made.

Curschmann¹ has studied the blood in 60 cases of **appendicitis**, paying particular attention to the leukocyte count, and is convinced that a leukocytosis of from 20,000 to 25,000 is an absolute indication of suppuration, and that it is a more reliable guide than palpation or the state of the pulse and temperature. As the amount of pus increases the leukocyte count rises; after its evacuation the leukocytosis gradually disappears.

J. C. DaCosta, Jr.,² presents a study of the blood in 118 cases operated upon for **appendicitis** at the German Hospital, Philadelphia. Of these cases, 38 were unattended by suppuration. In the others suppuration was present in varying degrees. In nearly every case of appendicitis the hemoglobin is diminished, the average loss being about 30 %. In the catarrhal and interstitial forms of appendicitis there is little or no rise in the leukocyte count. When, however, there is abscess, gangrene, or general peritonitis, the count rises to from 15,000 to 20,000 or even more. The average count in the cases recorded was 17,450. Leukocytosis may be absent or even leukopenia may occur in cases of profound sepsis when the patient is so poisoned that reaction is prevented. Such a condition, however, is rare. In but 2 of the 12 fatal cases of DaCosta's series was a well-defined leukocytosis absent. In these 2 cases the counts were 6000 and 11,200. DaCosta states that a leukocytosis of from 10,000 to 17,000 cannot be depended upon in diagnosing the variety of appendicitis, but that if the count rises to 20,000 or more it is indicative of pus, gangrene, or general peritonitis. Drainage of the abscess results in a gradual subsidence of the leukocytosis. When this does not take place, drainage is usually interfered with. The leukocyte count is no aid in differentiating inflammatory conditions of the appendix and like conditions in the pelvic or abdominal viscera, but will be found of great value in differentiating appendicitis from typhoid fever. It is also useful in separating appendicitis from enteralgia, lead colic, ovarian neuralgia, movable kidney, etc.

Leukocytosis as a point of prognosis in appendicitis is considered by Joy and Wright,³ who, after discussing the subject and referring to a few cases, reach the following conclusions: " (1) The leukocyte count is a valuable aid to prognosis in appendicitis. (2) This is distinct from its diagnostic value. (3) A high stationary or an increasing count indicates a morbid condition of increasing severity which demands operation, no matter what the clinical symptoms may be. (4) A low stationary or a decreasing count indicates that the severity of the case is abating and

¹ Wien. klin. Woch., Dec. 26, 1901.

² Am. Jour. Med. Sci., Nov., 1901.

³ Med. News, April 5, 1902.

that operation may be safely postponed. Cases in which a falling count is accompanied by unmistakable signs of a generally bad condition form the rare exception to this second principle, and in them there is no chance of error. (5) No arbitrary set of prognostic values to be assigned to various degrees of leukocytosis can be constructed. The important point is to follow any scheme in which one learns to have confidence, provided the essential principle be observed. (6) The count indicates when operation should be performed for the best interests of the patient. (7) Circumstances often render it desirable to postpone operation in appendicitis. Study of the blood-count enables it to be determined whether this may be done with safety and often renders such postponement permissible." [We do not believe that a decreasing leukocyte count is a sufficient reason for postponing operation. The count may decrease when the vital reaction of the organism is being broken down by systemic poisoning.]

Willy Meyer¹ writes upon "**What can we diagnosticate in acute appendicitis?**" Regarding the best time for operation, the author states that unless he finds immediate indications for operative interference he places a patient with a pronounced first attack of acute appendicitis under the most careful clinical observation; this observation can be carried out only by a well-trained nurse. In pronounced second attacks of appendicitis immediate operation is urged. If within the first 24 or 48 hours after the onset of the first acute attack of appendicitis the patient's pulse goes up to 116 or 120 and has a tendency to stay there for several hours, and if the pain and tenderness are pronounced, operation is performed at once. A high temperature is another sign indicating the necessity for operation. With a moderate temperature, rapid pulse, and marked pain and tenderness, and particularly if a chill occurs, temporizing should not be indulged in, but an operation should be performed at once. The surgeon must also be somewhat guided by the general appearance of the patient. It is the author's custom to operate when in doubt. If a patient recovers from a first pronounced attack of appendicitis without operation, an interval operation a few weeks later should be advised emphatically. In a case in the country early operation should always be advised because of the circumstances, which do not permit of prompt operation in case the necessity for it should arise, and because of the frequent inability to watch the patient carefully. With regard to the location of an acutely inflamed appendix, Meyer does not believe that it is possible accurately to make such a diagnosis, nor does he think, in the majority of cases, that it is possible to diagnosticate the true pathologic condition with any degree of certainty. The author does not intend to discourage efforts at sharpening diagnostic capabilities, but states that our present knowledge of appendicitis is not sufficient for us to rely upon a supposed pathologic condition. He does not agree with Sonnenburg, who states that he can diagnosticate the pathologic lesion of the acutely inflamed appendix, and thinks that it is a great error to teach that this can be done or to lay down rules for or against operation. Some idea can be obtained regarding the degree and extent of a complicating

¹ Amer. Med., April 12, 1902.

peritonitis. Tenderness over the left lower abdomen indicates an intense and often spreading peritonitis. Paresis of the large bowel, tympanites, continued vomiting, great tenderness all over the abdomen and on rectal palpation, with dulness on percussion of the right iliac fossa or over the whole lower part of the abdomen, indicate a general peritonitis. Tenderness in the left lumbar region, the point furthest away from the seat of disease, also indicates an extensive peritonitis. Meyer thinks that little is to be gained from persistent efforts to palpate an appendix between attacks, and that harm may result from such endeavors, since frequently suppuration may have taken place in the appendix and little tenderness or pain be present. Rough palpation of such a case might result seriously.

Elsberg¹ also deals with the question as to **what can be diagnosed in acute appendicitis**. It is impossible to lay down fixed rules for determining the exact pathologic conditions present in appendicitis, because in some cases the severity of the disease is in inverse proportion to the acuteness of the symptoms, while in other cases the pathologic changes in the appendix are slight when the symptoms of general poisoning are very severe. Dependence must be placed upon the pulse, the pain, the temperature, and the other symptoms, as indications of the severity of the disease and of the treatment to be applied. It would be a great mistake to attempt to diagnosticate the pathologic condition of the appendix and let this pathologic diagnosis indicate the treatment; the symptoms must indicate the treatment and not the supposed pathologic condition. It is proper and right, however, that surgeons continue to learn more about the clinical indications of the various pathologic changes found in the appendix.

The subject of **appendicitis** is reviewed by Deaver,² who states that the appendix is the most vulnerable of the abdominal organs because of its deficient blood, nerve, and lymphatic supply, its length and caliber, and because of its liability to traumatism in its association with the psoas muscle. It is shown by the author that it is very difficult and oftentimes impossible to distinguish clinically between the different pathologic varieties of appendicitis. The majority of cases, however, are of a chronic character, many cases diagnosed as acute appendicitis being only exacerbations of chronic inflammation. Not infrequently the whole pathology of appendicitis is demonstrated in one patient. It is stated that obliteration of the lumen of the appendix is of the rarest occurrence, is not to be expected, and never to be relied upon. Deaver lays particular stress upon the rapidity and suddenness with which the appendix may become diseased and gangrenous, giving rise to a fatal peritonitis. The three principal symptoms of appendicitis are pain, tenderness, and rigidity. Pain is the most important of these symptoms, is paroxysmal, and may at times almost disappear. The site of the pain will entirely depend upon the position of the appendix. In examining an abdomen for appendicitis, always palpate at a point some distance from the supposed seat of the disease and then gradually approach the point of tenderness.

¹ Med. Rec., April 5, 1902.

² Jour. Am. Med. Assoc., July 13, 1901.

When an abrupt cessation of pain occurs, it indicates gangrene of the appendix. As soon as a diagnosis of appendicitis is made the appendix should be removed. Neither temperature nor blood-count are considered of much value in making a diagnosis.

Chas. A. Elsberg¹ makes a contribution to the **pathology, diagnosis, and treatment of subphrenic abscess occurring after appendicitis**, and shows a table of 73 cases which he has been able to collect from the literature on the subject. Two of the cases in the table were operated upon by the author. These two occurred among 91 cases of appendicitis which were operated upon within 12 months at the Mt. Sinai Hospital. A subphrenic abscess may result from appendicitis either by direct extension or through the lymph-channels. The abscess may be intraperitoneal or extraperitoneal. Perforation of the diaphragm or bulging in the lumbar region is apt to occur early in the extraperitoneal variety. Of the 73 cases collected, the abscess was extraperitoneal in 20 cases, intraperitoneal in 35, and the location doubtful in 18. The inflammatory process in the subphrenic region does not always go on to suppuration, but may terminate with the exudation of fibrin and the formation of adhesions between the liver and diaphragm. This statement is illustrated by the report of a case in which a perihepatitis developed, followed by a pleurisy with effusion. The symptoms of perihepatitis subsided, but the pleurisy persisted until the fluid was withdrawn. In most of the cases suppuration had taken place in the right iliac fossa, but that this condition is not essential to the formation of a subphrenic abscess as the result of appendicitis is shown by 7 cases in the table in which no abscess was present. The position of the subphrenic abscess depends somewhat upon the position of the appendix. In 17 patients of the 73, the appendix was behind the cecum; in 12 it was in front or below; and in 42 patients the position was not given. If the appendix is in front or to the inner side of the cecum, the inflammatory process is likely to extend upward along the inner side or in front of the colon to the dome of the diaphragm, and when it lies behind the cecum the inflammatory process extends up behind the ascending colon to the diaphragm. In the extraperitoneal subphrenic abscess the quantity of pus is usually smaller than in the intraperitoneal variety. Depression of the liver and paralysis of the diaphragm occur more frequently and earlier in the intraperitoneal variety. The pus is generally thick and has a foul odor. In about 15 % of the cases gas is present in the abscess. In 25 % of the reported cases perforation of the diaphragm occurred. This complication occurred, however, in cases where operation was prolonged or where it was not instituted. The symptoms of subphrenic inflammation may present themselves within a few days or not until weeks or months after the appendicitis or operation for it. Three modes of onset are described by Elsberg. One, in which the symptoms of appendicitis have been relieved, the temperature has fallen to normal, and the patient then begins to complain of pain in the lower part of the right chest; the temperature rises; liver dulness enlarges; friction sounds develop over the hepatic

¹ Ann. of Surg., Dec., 1901.

region; tenderness is present in one or two intercostal spaces; and a jaundice of variable degree sets in. With the subsidence of the pain the evidences of fluid accumulation present themselves. In the second form the symptoms set in before those of appendicitis have subsided, the fever becoming remittent and the patient losing flesh and strength rapidly; no complaint of pain is made, though some tenderness may be present; no definite symptoms occur, however, until the abscess produces a bulging in the lumbar region. In the third variety the patient fails completely to regain strength after the appendicitis, complaining of continual slight pain in the right chest without any change in temperature, pulse, or respiration. After a variable length of time the symptoms of a subphrenic or pleural accumulation show themselves.

In **diagnosing a subphrenic abscess** the most important symptom is said to be pain, together with the localized tenderness somewhere between the eighth and eleventh ribs, and between the mammary and posterior axillary lines. When the abscess contains gas, the diagnosis is more readily made because the liver dullness is obliterated. The fact that there may, in addition to the subphrenic condition, be a pleuritic effusion may somewhat obscure the diagnosis. When the dullness is due to a pleural effusion, it will be found to change its position when the patient's position is altered, which does not take place with subphrenic accumulations of fluid. In a subphrenic abscess, too, there is not apt to be the presence of those thoracic symptoms which characterize the onset of a pleurisy with effusion. Perforation of the diaphragm is indicated by the sudden appearance of cough, rapid respiration, expectoration, and not infrequently collapse. The differential diagnosis between liver abscess and subphrenic abscess is often extremely difficult. Abscess of the liver, however, is much less frequent after appendicitis than subphrenic abscess. Pain in the right shoulder-blade is rare in subphrenic abscess but frequent in liver abscess, and the reverse is true regarding paralysis of the diaphragm. Chills and profuse sweats point to liver abscess. The differential diagnosis between the two conditions can be made only through the use of the aspirating needle and the microscopic examination of the fluid obtained. Elsberg presents a much lower mortality rate than Maydl, Sonnenburg, and Sacks. His mortality rate agrees with these authorities, however, in showing that the death-rate is nearly twice as high when no operation is performed. Another point upon which all agree is the fact that the mortality is much lower in the cases which are operated upon early. Out of 51 patients operated upon, 11 died; and out of 22 patients not operated upon, 18 died. Of the 4 patients recovering without operation, 3 did so after perforation into the bronchus, and in the fourth the subphrenic abscess formed a part of the original appendiceal abscess.

In **treating subphrenic abscess** it is well to be sure that the local condition about the appendix has been entirely relieved, and, if necessary, free drainage should be established here. As soon as the general symptoms and physical signs warrant it, Elsberg recommends the use of the exploring needle. If an abscess should point below the free margin of the ribs or in the lumbar region, it should be promptly and

freely incised. If, however, the aspirating needle shows the pus to be situated deep on the upper surface of the right lobe of the liver, it may be drained after resection of one or more ribs, either below the pleura or through the pleural cavity. The operation suggested by the author is that 2 inches of the ninth and tenth ribs be resected somewhere between the scapular and anterior axillary lines, according to the situation of the pus; and when this has been done, the diaphragm, with the liver moving below it, will appear in the lower portion of the wound and the pleural reflection will be seen in the upper part. This approach permits of an opening below the pleura, and also of drainage of the pleural cavity if this be deemed necessary. The exploring needle is then introduced into the abscess cavity and used as a director. The situation of the abscess may be so near the median line, however, that in order to drain it the pleural cavity must be entered. Under such circumstances the liver should be pushed well up by an assistant while the pleura is divided and its two layers firmly sutured together. The pressure upon the liver is considered of the greatest importance, as it prevents the entrance of air into the pleural cavity when this tissue is divided. When it is impossible to stitch the visceral to the parietal pleura, the pleural cavity should be protected by gauze packing.

Warden¹ records a case of **diffuse peritonitis resulting from appendicitis** in which there subsequently developed a subphrenic abscess requiring drainage. Later an abscess of the lung developed and opened into a bronchus. The patient finally recovered.

Jos. M. Spellissy² presents an extensive communication on the subject of **abscess in the right iliac region and other lesions not of gynecologic or appendiceal origin mistaken for appendicitis**. Reports of 194 cases are referred to in which a mistaken diagnosis of appendicitis was made, and the conclusion is reached that "a diagnosis in cases with symptoms pointing to the right iliac fossa should not be made without a routine, conscientious examination for, and exclusion of, the various troubles that may exhibit misleading symptoms and signs." [Because appendicitis is the common acute lesion of the right iliac fossa we are prone to act as though it is the only lesion. Spellissy's paper emphasizes this fact and is a timely contribution. To act as though it is the only lesion is to be as the diplomatist who admits of no cause of European disturbance but the Eastern question.]

A case of **suppurative pericarditis following appendicitis** in which incision and drainage were successfully employed is reported by A. H. Mann.³ The patient was a girl aged 12. In addition to the symptoms of appendicitis, which were well marked at the time of operation, the patient also complained of pain in the right wrist, in the left knee, and in the left ankle. These joints were swollen and painful and contained fluid. The patient was removed to the hospital for operation, but the next day the abdominal symptoms had nearly entirely disappeared, so that operation was not performed. The joint condition, however, re-

¹ Amer. Med., Jan. 25, 1902.

² Ann. of Surg., June, 1902.

³ Ann. of Surg., Oct., 1901.

mained the same, presenting the appearance of acute articular rheumatism. Four days after her admission a mitral murmur was noticed for the first time, although repeated examinations of the heart had been made. Three days later the patient had much difficulty in breathing and was very ill, with a temperature of 104° F., pulse of 140, and the respirations were 40. Cardiac dullness was greatly increased, extending several inches to the right of the sternal line; the heart-sounds were indistinct. On the next day the pericardial dull spot described by Ewart was quite marked. This spot extended to the middle line along the lower border of the scapula, and to the left for a distance of about 4 inches, reaching as high as the spine of the scapula. The heart-sounds could be heard very distinctly at the back, while at the front they were indistinct. Two days later these symptoms had not improved, but were rather aggravated, and a diagnosis of suppurative pericarditis was made and it was determined to drain the pericardium. After the patient had been anesthetized an aspirating needle was introduced through the fifth intercostal space, but no fluid escaped. The needle was then withdrawn and introduced through the fourth intercostal space about 2 inches to the left of the sternum. At this position about 2 drams of bloody purulent material were withdrawn. An incision was then made parallel with the sternum and 2 inches to the left of it. Two inches of the fourth rib were resected, the internal mammary artery ligated, and the pericardium opened. A large quantity of purulent fluid escaped. Most of the fluid was behind the heart, a large quantity escaping when the patient was rolled over on the left side. The pericardium was then sutured to the edges of the wound and the cavity drained with a strip of gauze. The pleura was not seen during the operation. Although the pulse did not drop immediately after the operation, the patient was rendered quite comfortable, suffering no distress in breathing. The second day after operation rubber tubes were substituted for the gauze drain, which proved ineffectual. The temperature and pulse then rapidly dropped and the patient made a satisfactory recovery. The drainage-tubes were removed on the tenth day. The patient one year after operation had gained very much in weight, but still had a mitral murmur. There is no doubt in Mann's mind that the patient suffered from an acute appendicitis in the beginning of her illness. The condition of the joints, although closely resembling acute articular rheumatism, was probably due to general septic infection. The author thinks that the original infection was probably due to the pneumococcus. The symptoms in the beginning of the illness were typical of appendicitis, and the fact that suppuration did not apparently take place rather strengthens the theory that the case was one of pneumococcus infection. The fact that the pus was not obtained when the aspirating needle was introduced through the fifth intercostal space, and only later through the fourth intercostal space when suction was employed, was shown clearly by the operation to be due to the fact that the fluid occupied the posterior part of the pericardial sac, the heart being pushed forward. When the needle was introduced, the cardiac pulsations could be distinctly felt striking against it.

L. W. Hotchkiss¹ tells of 3 interesting cases of **obstruction of the bowels following operations for appendicitis**, in each of which an operation was done which relieved the condition. The subject is dealt with at considerable length and the belief expressed that the condition is a more common postoperative complication than is generally supposed. An examination of the "Transactions of the New York Surgical Society" shows that 20 cases have been reported since 1893. Hotchkiss's first patient was a male 26 years of age, who was operated upon for acute perforative appendicitis. Acute intestinal obstruction occurred 16 days after the operation, and a secondary operation was done. The obstruction was due to a thick band from the edge of the great omentum which extended into the region of the old appendiceal abscess. The bowel constricted was a portion of the ileum. The patient made a rapid convalescence after the operation. The second case was a male 14 years of age who was operated upon for acute appendicitis complicated by a progredient fibrinopurulent peritonitis. Acute obstruction occurred in this case on the ninth day and the patient was operated upon on the tenth day. In the second operation a kink was found in an adherent coil of small bowel which completely obstructed its lumen. In separating adherent small intestine on the left side of the pelvis a large abscess was opened which contained a quantity of foul pus. The abscess was drained and the abdomen closed. The patient was in a very bad condition, but made a satisfactory convalescence except for a fecal fistula which ultimately closed. Hotchkiss's third case was particularly interesting. The patient was a man 24 years of age who was first seen 3 weeks after an operation for acute suppurative appendicitis and 6 days after the onset of symptoms of obstruction of the bowels. In this case the small bowel was so distended that it was necessary to make several incisions into it before a proper search of the intestinal tract could be made. This patient was in very bad condition when placed upon the table. His condition improved somewhat when the abdomen was opened, but the relief following the incisions into the bowel was most striking. The obstruction in this case was due to a thick band about the lower portion of the ileum. The compressed portion of the bowel, although not gangrenous, was in a condition which threatened trouble. Resection at the time, however, was thought inadvisable, so this portion of the bowel was placed immediately under the incision in the abdomen, salt solution was poured into the abdomen, and the wound was closed. The patient was very ill after the operation. Great benefit was obtained by the use of gastric lavage and by the employment of the rectal tube. The wound showed evidences of infection 8 days after the operation, and was opened. Later the discharge from the wound became fecal. About 10 days after the second operation the fistula became obstructed and the patient suffered from a well-nigh fatal attack of acute obstruction. The condition was relieved by the spontaneous discharge of enormous quantities of fluid through the fistulous tract. As the fecal fistula evidently had its origin in the small intestine, resection of a portion of bowel was determined upon, and the

¹ Ann. of Surg., Nov., 1901.

operation was performed 3 weeks after the last attack of obstruction. The bowel resected was the portion regarding which the operator had had some doubt at the second operation. At the third operation the bowel was found adherent in numerous places and its separation required considerable time. The portion resected was several inches in length. An end-to-end anastomosis was made with silk sutures. The patient recovered satisfactorily from this operation. In discussing this subject Hotchkiss states that the diagnosis of acute intestinal obstruction after appendicitis is easily made, especially when it arises some time after the primary operation, when the temperature is normal and all symptoms of inflammation have subsided. Since the obstruction occurs nearly always in the small bowel, and is often complete from the beginning, the onset of the symptoms is apt to be sudden. The diagnosis of acute obstruction immediately after an operation for appendicitis is not so easily made, for here the condition may be due to one of several causes: a postoperative ileus, a progressive peritonitis, or a mechanical obstruction of the bowels. When a diagnosis of obstruction has been made, the writer urges that the abdomen be opened in the median line rather than through the old wound. The reluctance of surgeons to reopen an abdomen after an operation for appendicitis for symptoms of obstruction is difficult to overcome, and the fact that in many cases the abdomen has been opened and only a general peritonitis has been found has tended to increase this reluctance. Hotchkiss advises that wherever a diagnosis of acute obstruction of the bowels is reasonably sure, no time should be lost in performing a second operation to remove the cause of obstruction. Delay in these cases is a great mistake. In cases in which the obstruction is first partial and later complete, there is a strong temptation to persist in the use of enemas. This plan should not be followed, but the abdomen should be opened. The most important factor in influencing the prognosis of these cases is the period at which the diagnosis is made and the promptness with which the operation is performed. Those cases in which the condition is recognized early and relieved promptly by operation give remarkably good results, while the late cases present many complications and a high mortality. The author is a strong advocate of the use of salt solution in the peritoneal cavity, the subcutaneous tissues, and the rectum, or its injection into the veins. In 2 of his cases he attributes the recovery from an extremely dangerous condition to the use of salt solution. Free incision into overdistended coils of bowel in order to relieve pressure upon the diaphragm, to relieve the congested intestinal vessels, and to diminish the size of the distended coils, is also strongly advocated. The author believes in filling the abdominal cavity with salt solution and closing it without drainage when practicable. Stress is laid upon the importance of the postoperative treatment in these cases, and the author recommends the persistent and intelligent use of the stomach-tube, repeated administration of saline purges in concentrated solution (introduced through the stomach-tube if not retained when taken by the mouth), the employment of the rectal tube for the removal of gas, and the use of high enemas. Hotchkiss absolutely abstains from giving morphin.

J. G. Sheldon¹ reports a case of **appendicitis** which when seen was too far advanced for operation, and which presented **thrombosis and suppuration** in the right iliac and femoral veins. It is thought that in this case the inflammatory process within the veins was due to direct extension from the appendiceal abscess.

Chas. L. Scudder² records a case of **gangrenous appendicitis** in which there were extensive adhesion of the intestine, an appendiceal abscess, general peritonitis, and areas of gangrenous bowel-wall. Drainage was established but the patient died. The intestinal wall which was in contact with the pus was found to have over its surface in many places dark bluish-black areas the size of the tip of the finger which were soft like wet blotting-paper, and through these points it was extremely easy to push with even very gentle pressure. At the postmortem the appendix was found to be gangrenous, there was a diffuse chronic pericarditis, and a subphrenic abscess with multiple peritoneal abscesses.

Sam'l W. Evans³ reports a fatal case of **gangrenous appendicitis** in which there was not one cardinal symptom of the disease. The patient was a child of 9 who was ill for 5 days. Every 24 hours marked a decided increase in the pulse-rate and in the symptoms of toxemia. The patient had practically no rise of temperature until 30 hours before death. The case was recognized as one of septic infection, but there was nothing to localize the cause of the condition. The patient was seen by a number of eminent men, none of whom were able to make a diagnosis. The autopsy showed a gangrenous appendix and localized incipient gangrene of the small intestine and acute parenchymatous myocarditis. It is considered that the infection was so severe as to produce death before peritoneal symptoms had developed.

Müller⁴ writes upon the **topography of the vermiform appendix**. The author lays particular stress upon the fact that the appendix always is attached to the cecum, where the three longitudinal bands of this bowel meet, and that if the surgeon will make it a rule, in cases where the appendix is difficult to find, to trace the anterior longitudinal band to its extremity, the base of the appendix can always be found.

An unusual case in which the **appendix was passed by the bowel** is reported by W. L. Wallace.⁵ The patient suffered from a typical acute attack of appendicitis and was removed to the hospital for operation. Immediate improvement took place, however, and operation was postponed. Ten days later subacute symptoms developed and an indefinite mass appeared in the right iliac region. Improvement again promptly took place the pain, tenderness, and rigidity disappearing, and the pulse and temperature remaining normal. Because the indefinite mass could still be felt, and because of the previous attacks, operation was determined upon. The day before the one set for operation the nurse found the appendix in a bowel movement. The appendix was $3\frac{1}{2}$ inches long and consisted principally of the mucous and submucous coats. It was per-

¹ Phila. Med. Jour., July 27, 1901.

² Boston M. and S. Jour., Oct. 17, 1901.

³ Med. Rec., Mar. 29, 1902.

⁴ Centralbl. f. Chir., No. 27, 1901.

⁵ Amer. Med., Nov. 9, 1901

forated near the distal extremity and contained several concretions, one of which protruded from the perforation. Twenty days after this occurrence the patient was apparently perfectly well and the mass had entirely disappeared. Wallace believes that this was a case in which the base of the appendix was involved in an abscess which resulted in its separation. It is also supposed that there was a considerable destruction of the cecum which permitted the appendix to pass into this bowel.

An interesting case in which the **appendix acted as a mechanical cause of intestinal obstruction** is reported by J. E. Somers.¹ The patient was a woman 52 years of age. Somers saw her 5 days after the beginning of symptoms of obstruction of the bowels. At this time the abdomen was distended and obstruction was absolute. No cause for the obstruction could be discovered. The abdomen was opened and a long appendix, which was adherent at its distal end to the mesentery of the ileum, was found. The appendix acted as a ring extending nearly completely around a portion of the ileum about 2 feet from the ileocecal valve, producing absolute obstruction of the bowel. So much pressure had been exerted upon the bowel-wall that its vitality was rendered questionable. The appendix was removed and the patient made a satisfactory recovery.

Finney and Hamburger² discuss the **relationship of appendicitis to infectious diseases**, and particularly to rheumatism. Three cases are recorded in which there was an association of appendicitis and rheumatism. It is stated that there is occasionally an intimate relationship between polyarthritis and appendicitis. The articular disease may precede as well as accompany or follow the appendicular inflammation. Attention is called to the analogous structure of the tonsil and the appendix, which is well known to all anatomists, and which has been dwelt upon by a number of clinicians. Another point of interest is the fact that appendicitis in rheumatic patients is favorably acted upon by salicylates; this, however, is considered the least potent argument in favor of the association of the two conditions. The authors are careful to state that although appendicitis may be of rheumatic origin, it does not alter the fact that it is a condition which belongs entirely to the domain of surgery, and that it would be a grievous error to rely on sodium salicylate in the treatment of any case of appendicitis, even though the disease is rheumatic.

J. Riddle Goffe³ reports a case of **primary carcinoma of the tip of the appendix** in which operation was performed for supposed chronic appendicitis. One of the striking features of the case is the age of the patient—15 years. He presented all the symptoms of chronic appendicitis. The appendix was found unusually long, thickened, and tortuous, and at its extreme tip there was a round white body about the size of a large marrowfat pea. The appendix was removed and the wound closed. An examination of the growth by Jeffries proved it to be a typical carcinoma.

¹ Amer. Med., May 24, 1902.

² Amer. Med., Dec. 14, 1901.

³ Med. Rec., July 6, 1901.

A case of **appendicitis occurring in a child 3 months of age** is reported by J. P. Crozier Griffith,¹ who has collected 15 cases of appendicitis occurring in children 2 years of age and under. In the case reported there was an acute general peritonitis, and when admitted to the hospital, the patient was beyond surgical relief. Appendicitis occurring at the age of 2 years or less is very unusual. Of the 15 cases reported, in 9 the appendix was found to be perforated; in 4 the appendix had descended into the scrotum; 9 cases were operated upon with 7 recoveries; and in 2 cases the disease had been diagnosed as intussusception.

In speaking of **appendicitis tuberculosa**, Andrews² refers to the warning of Sonnenburg that this condition simulates closely that of carcinoma and old appendicular abscess. In 3 of the cases reported by the author the condition was mistaken for acute appendicitis; in the fourth case, however, a correct diagnosis was made before operation. In none of these cases was it found possible to resect the diseased parts, which is always the ideal method of treatment. The disease is one which produces an enormous thickening of the tissues which results in stenosis of the ileocecal valve. Late in the disease ulceration of the mucous membrane occurs. Because of the difficulty of diagnosis and the resemblance to acute appendicitis the operation is often one of emergency. The means employed for the treatment of the condition are as follows: "(1) Laparotomy for simple exposure. This has the same value here as in other forms of tubercular peritonitis. (2) Excision of omental masses and breaking up adhesions; (3) artificial anus; (4) partial resection of wall of cecum or plastic operations thereon; (5) lateral anastomosis or 'partial exclusion'; (6) resection of cecum or 'total exclusion.' The resection of the ileum and cecum has been done repeatedly, and is the ideal method of dealing with both tuberculous and malignant ileocecal tumors."

F. C. Madden,³ of Cairo, reports an interesting case of **appendicitis with general peritonitis**. At the primary operation simple drainage was established. The second day after the operation there was a return of all the symptoms of general peritonitis with marked distention of the abdomen and fecal vomiting. The third day after the operation these symptoms were most marked, and at this time Madden removed a few sutures, exposed the cecum, and incised it. The cecum was closely adherent to the abdominal wall and no general infection followed the establishment of an opening at this point. This treatment resulted in an immediate cessation of symptoms, and the patient ultimately recovered.

The **mortality of appendicitis**, based upon an analysis of 268 operations performed at the German Hospital, Philadelphia, during the year 1900, is discussed by Deaver and Ross.⁴ Of these cases 144 were operated upon during an acute attack, and 26, or about 18 %, died either from the disease or some intercurrent trouble. One patient died of diabetes, another had advanced phthisis, and a third died of a postoperative pneu-

¹ Univ. of Penna. Med. Bull., Oct., 1901. ² Ann. of Surg., Dec., 1901.

³ Lancet, May 31, 1902.

⁴ Jour. Am. Med. Assoc., Oct 5, 1901.

monia. If these 3 are eliminated, the mortality is reduced to 15.9 % for acute appendicitis. Of the 26 fatal cases, 7 had general purulent peritonitis at the time of operation. Septicemia was the cause of death in 8 cases. Secondary collections of pus were met 11 times; 7 times in the pelvis, 3 times in the postcecal region, once to the left of the appendix region, and once in the abdominal wall. Gangrene of the cecum and colon was encountered 7 times; 5 times it was met with at the time of operation and twice it developed subsequently. The most common cause of death in cases not submitted to operation is septic peritonitis. Obstruction of the bowels is also a frequent cause of death in these cases. Occasionally septic material is deposited in distant organs, such as the liver, brain, heart, etc. Occasionally an abscess will rupture into the bladder, producing a fatal cystitis or pyelitis. In cases of chronic appendicitis where no adhesions are present, or in acute appendicitis where the disease has not extended beyond the peritoneal coat, the mortality should not be above that of any aseptic abdominal operation. The presence of adhesions adds considerably to the mortality rate. Of 124 cases, which included all the chronic cases and those acute ones in which the inflammation had not extended beyond the peritoneal coat, there was but one death. Particular attention is called to the rapidity with which the disease progresses in some cases. Deaver and Ross do not think it is possible for a patient to recover from a general purulent peritonitis. They lay stress upon the necessity of evacuating and draining all pus pockets. Except in a few cases it is thought that the appendix should be removed in all pus cases. Necrosis of the bowel, probably due to septic emboli in the veins of the mesentery, metastatic abscesses, septic endocarditis, and obstruction of the bowel, account for death in many of the acute cases. Of the 118 acute cases which recovered from operation, in 61 pus was present. In 21 of these 61, the appendix was perforated and gangrenous. Fecal fistulas occurred 6 times; 4 closed spontaneously and 2 required operation. During the year 1900 there were 11 cases of appendicitis at the German Hospital which were not operated upon: Of these, 3 died and 5 left the hospital with a mass in the right iliac fossa. It has been the author's experience that appendicitis increases in severity with each attack. The diseases complicating appendicitis—among which are diabetes, nephritis, septic pneumonia, etc.—are discussed. In phthisical cases operation is advised only as a last resource. It is stated that appendicitis due to the typhoid bacillus is much more common than is generally believed, and that the fever is no contraindication to surgical treatment. It is said that delay is a greater causative factor in the mortality of appendicitis than any of the complications of the disease. Deaver has not found the subarachnoid injection of cocain of advantage in operations for appendicitis.

Wm. H. Battle¹ speaks of the **advisability of removing the appendix after suppuration caused by appendicitis**, and reports a number of cases of recurrent appendicitis after simple incision and drainage of abscesses. The author states that, except where the appendix has

¹ Lancet, Jan. 18, 1902.

sloughed off and is lying free in the pus, or comes away during the healing of the abscess, which latter is very rare, the organ should be excised in all cases after the patient has recovered from the suppuration, if it is not found possible or advisable to remove it when the abscess is opened. He also states that the removal of the appendix at a second operation when the parts are quiet will give better chances to the patient in many, if not most, of the cases than a removal unwisely attempted or persisted in at the first operation.

Robt. T. Morris¹ points out the **disadvantages of gauze packing in appendicitis work**. The author claims that even a healthy peritoneum resents the introduction of gauze drains. Morris particularly objects to the employment of iodoform gauze, stating as his belief that this variety of drainage is the cause of many deaths after appendicitis operations. The presence of gauze drainage depresses the patient's general resistance and prolongs, when it does not cause, the condition of surgical shock. Morris does not mean to teach that gauze drainage is to be given up at once, but does advise all surgeons to work toward the point of giving it up as rapidly as experience proves that it can be done safely.

J. H. Carstens² discusses the **conservative treatment of appendicitis, and condemns what he terms the fallacy of the starvation cure**. Three cases are reported in which the starvation treatment was employed, in all of which operation became later imperatively necessary because of urgent symptoms, and 2 of which died. In each of these cases the acute symptoms subsided under the starvation treatment, but in each there was later a sudden aggravation of symptoms calling for immediate operation. The author condemns heartily the conservative treatment of acute appendicitis and considers that the only proper treatment is a prompt operation. He allows for certain exceptions, but states that as a general rule every case of acute appendicitis should be operated upon when the diagnosis is made, and that in his opinion the starvation method has resulted in the loss of many lives.

Russell³ reports an interesting case of **appendicitis in a child 9 years of age**. The child was admitted to the Melbourne Hospital for Sick Children in December, 1900, for frequent attacks of abdominal pain occurring particularly at night. The pain was also brought on by any exercise, such as running or going up and down stairs. The pain was always referred to the umbilicus. At this point there was a small umbilical hernia. During the patient's stay in the hospital he suffered no pain except when the abdomen was examined, and then he complained of great pain about the umbilicus. He was discharged, but continued to complain, and was readmitted in July, 1901, when an exploratory operation and a cure of the umbilical hernia were determined upon. The abdomen was opened and all the viscera were found normal except the appendix, which was very long and tortuous and somewhat distended. After removal and upon examination the mucous membrane of the appendix was found thickened and injected and its cavity was occupied by a

¹ Med. Rec., Mar. 22, 1902.

² Chicago Med. Rec., Jan., 1902.

³ Intercol. Med. Jour. of Australasia, Dec. 20, 1901.

large number of **thread-worms**. The patient made an uneventful recovery. The mother stated that all of her 13 children—of whom the patient, aged 9, was the eldest—were infested with thread-worms.

Richard W. Westbrook¹ discusses the question of **drainage in appendicitis with outlying peritoneal infection**, and reaches the following conclusions: "(1) There are as yet no well-recognized formulas to guide the surgeon as to when to omit drainage in purulent collections attending appendicitis. (2) While it is true that the peritoneum may be relied upon to take care of a certain quantity of infectious material, we have no means of estimating in any individual case what that quantity may be. It is contrary to experience to expect the peritoneum to care for any large quantity of infection, otherwise we would never have to operate at all for appendicitis or septic peritonitis. (3) An estimate of the individual's resistive powers to infection may be approximately made by the usual methods of consideration of the condition of his heart, lungs, kidneys, etc., his pulse and temperature, his previous health and habits, and perhaps, in some instances, by the amount of leukocytosis found on blood examination. But we have no means of placing over against this, at time of operation, an accurate estimate of the amount and virulence of the infection with which the patient's resistive powers will have to contend. And we cannot estimate any individual susceptibility or immunity to infection which he may possess. (4) If the surgeon decide to omit drainage in any case of appendicitis with outlying infection, he must do so relying entirely on his personal ability to estimate the clinical facts in the case, and the nature and extent of the pathologic process exposed at operation. Then, if his previous experience has brought him to the point of omitting drainage, he is warranted in doing so. (5) The majority of surgeons the world over still consider drainage necessary in all degrees of the class of cases under discussion, and that we must consider the safer teaching."

Miles F. Porter² compares the results obtained by early operation for appendicitis with those obtained by operation after other treatment has failed. He states that timely diagnosis and **early operation** constitute the **conservative treatment of appendicitis**.

A. S. Lobingier³ discusses the **important sequels resulting from late operations for appendicitis**, and urges them as sufficient reason for advocating early operation in all cases.

Joseph Price,⁴ under the title of "**green groin**" operations, takes occasion to urge upon both surgeons and medical practitioners the importance of early operation in every case of appendicitis.

Sir Frederick Treves⁵ discusses **some phases of inflammation of the appendix** in his Cavendish Lecture. He discusses the cause, symptoms, and pathology of appendicitis, maintaining the views generally held by the profession on these subjects. He warns physicians against making a diagnosis of appendicitis simply because the patient has tenderness in

¹ Brooklyn Med. Jour., Feb., 1902.

² Amer. Med., Sept. 7, 1901.

³ Amer. Med., Aug. 5, 1901.

⁴ Phila. Med. Jour., June 7, 1902.

⁵ Brit. Med. Jour., June 28, 1902.

the neighborhood of the appendix. Attention is also called to the not infrequent error of mistaking a localized contraction of the abdominal muscles upon palpation for an enlarged appendix. He is an ardent advocate of the interval operation, and states that in more than 1000 operations of this kind he has had but two deaths. Regarding the operative treatment of appendicitis he expresses the following views: (1) It is a mistake to base the necessity for immediate operation upon the idea that "gangrene or rupture of the appendix," "perforation of the appendix," and "appendicitis with acute peritonitis" mean the same danger and require the same treatment as do "gangrene or rupture of the bowel," "perforation of the stomach," and "acute peritonitis." (2) The greater proportion of cases of appendicitis recover spontaneously; if examples of all grades of appendicitis are included, the mortality of the disease will probably not be above 5 %. (3) Operation carried out during an acute attack is attended by a mortality of over 20 %. (4) Relapses may occur after operation done in the acute stage. (5) Removal of the appendix between attacks of appendicitis is attended by only a trivial risk.

HERNIA.

Wm. J. Mayo¹ describes an operation for the **radical cure of umbilical hernia** which he has found very successful in 19 cases. Mayo described this operation in 1898, and several other surgeons—Piccoli, Blake, and Sapiejko—have described operations which are almost identical with the one recommended by the author. Mayo says it is evident that the method has appealed independently to these various operators. The defect in former methods of operation which involve the approximation of the recti muscles is the natural separation of these muscles at the level of the umbilicus. Below the umbilicus the muscles are practically in contact, but above there is from $\frac{1}{4}$ to $\frac{3}{4}$ of an inch separation. In a small hernia the approximation of the recti muscles is not difficult, but when the hernial opening measures an inch or more in diameter it is impracticable. In the very corpulent patients in whom umbilical hernia is most frequent the muscular separation is greater. This separation can easily be brought out by directing the patient to rise from a recumbent position. Mayo has followed with satisfaction the advice of Wheaton to reduce the body-weight of very stout patients by keeping them in bed several weeks before operation. Mayo describes his operation as follows: "(1) Transverse elliptic incisions are made surrounding the umbilicus and hernia; these are deepened to the base of the hernial protrusion. (2) The surfaces of the aponeurotic structure are carefully cleared $1\frac{1}{2}$ inches in all directions from the neck of the sac. (3) The fibrous and peritoneal coverings of the hernia are divided in a circular manner at the neck, exposing its contents. If intestinal viscera are present, the adhesions are separated and restitution made. The contained omentum is ligated and removed with the entire sac of the hernia. (4) With forceps the margins of the ring are grasped and approximated; whichever way the overlapping is

¹ Ann. of Surg., Aug., 1901.

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easy of accomplishment, suggests the direction of closure. Figures 25 show the overlapping as done from above downward.



—Showing exposure of hernia and lateral incisions (Mayo, in *Ann. of Surg.*, Aug., 1901).

(5) For this approximation an incision is made through the aponeurotic and peritoneal structures of the ring extending 1 inch or more transversely to each side, and the peritoneum is separated from the under surface of the upper of the two flaps thus formed. (6) Beginning from 1 to 1½ inches above the margin of the upper flap, 3 to 4 silver-wire mattress sutures are introduced, the loop firmly grasping the upper margin of the lower flap; sufficient traction is made on these sutures to enable peritoneal approximation with running suture of catgut. The mattress sutures are then drawn into

on, sliding the entire lower flap into the pocket previously formed between the aponeurosis and the peritoneum above. (7) The free end of the upper flap is fixed by catgut sutures to the surface of the



—Aponeurosis sutured (Mayo, in *Ann. of Surg.*, Aug., 1901).

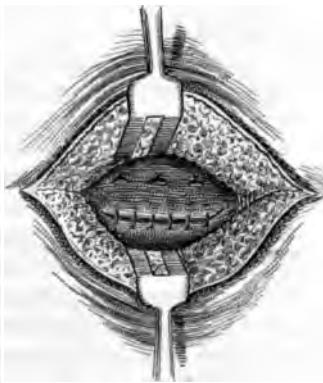


Fig. 24.—Aponeurosis sutured second time with gut sutures (Mayo, in *Ann. of Surg.*, Aug., 1901).

neurosis below, and the superficial incision closed in the usual manner. The lateral approximation is carried out by sliding one side under the other in the same manner. In the larger hernias the incision through the

fibrous coverings of the sac may be made somewhat above the base, thereby increasing the amount of tissue to be used in the overlapping process. In only one case were we unable satisfactorily to close the opening as described, on account of the large size of the umbilical ring. In this case less than $\frac{1}{2}$ an inch of overlapping was secured, and that under great tension; the result was a boat-shaped stretching of the united parts, but the symptomatic cure was excellent. The results in the other cases, so far as known, have been good, although many of them are too recent to be called cured, and possibly relapses will occur." Mayo's first operation by this method was performed in 1895. Of the 19 operations performed since that date, the overlapping from side to side was employed 10 times and from above downward 9 times. The large openings were found to be more easily closed by the latter method. In principle the operation resembles those of Championnière and Andrews for the cure of inguinal hernia. [We are satisfied that the plan suggested by Mayo is the best method for the cure of large umbilical hernias.]

Hammesfahr¹ offers a **new method of uniting the recti muscles in cases of median postoperative hernia**. The conditions producing such a hernia are described as the lateral traction of the other abdominal muscles upon the external borders of the recti and the pressure exerted upon their inner portions by the abdominal contents. The result

of this traction and pressure is to cause a separation and eversion of the internal borders of the muscles. To overcome this, the author recommends that the entire muscle on each side should be thoroughly exposed without opening the sheath or the peritoneal cavity; a number of wire sutures are then passed which enter the aponeurosis at the outer edge of the muscle, passing down to but not through the peritoneum and then out again through the opposite muscle in the same manner. The passage of these sutures can be easily guided by the forefinger underneath the muscle. When the sutures are tied, the result is an approximation and inversion of the separated and everted central margins of the recti. The principle of the suture is very much that of the Lembert suture employed in the closure of intestinal wounds.

L. L. McArthur,² in conducting experiments upon animals and human beings in the use of the **aponeurosis of the external oblique muscle as a suture material** for the purpose of closing the inguinal canal in the radical cure of hernia, separates a small portion of the fascia, about $\frac{1}{4}$ to

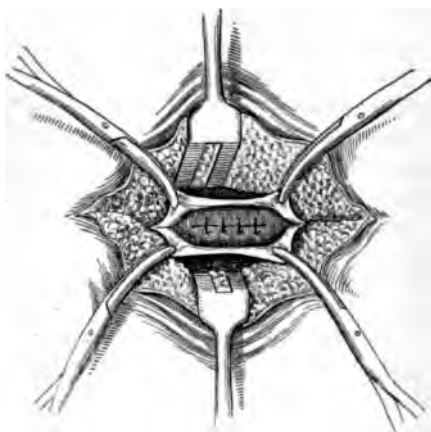


Fig. 25.—Peritoneum sutured (Mayo, in *Ann. of Surg.*, Aug., 1901).

¹ *Centralbl. f. Chir.*, 1901, No. 10.

² *Am. Med. Assoc.*, Nov. 2, 1901.

$\frac{1}{4}$ of an inch wide, from the internal pillar, except at its pubic attachment. A piece of silk with a needle attached is then fastened to the free end. This portion of fascia is flat when first cut, but soon assumes a round shape and can readily be drawn through the tissues by means of the needle and thread attached to its free extremity. When two layers of sutures are required, as in the Bassini operation, two strips of fascia may be separated, one from the internal and the other from the external pillar. The author has employed this method of suturing in 20 cases of inguinal hernia with perfect primary union in all. The following advantages are claimed for the method: "(1) The obtaining of a living suture;

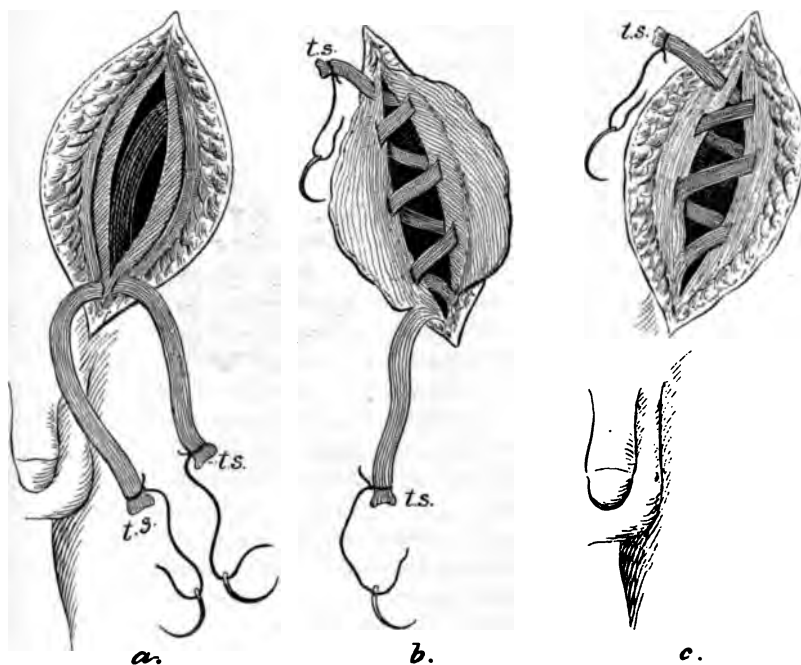


Fig. 26.—*a*, Schematic representation of two strips of tendon of external oblique, ready for suture; canal represented as opened; sac ligated and dropped back. *b*, Schematic representation of suture with *t.s.* tendon strip for deep layer; inner flap to inner aspect of Poupart's ligament. Artist has included inner flap of external oblique tendon as in Andrews. *c*, Similar representation of suture with *t.s.* outer flap to anterior surface of inner flap, when using Andrews's edge-to-edge with Bassini (McArthur, in Jour. Am. Med. Assoc., Nov. 2, 1901).

(2) lessened chances of failure through avoidance of introduction of dead or foreign tissue; (3) the incorporation in the resisting cicatrix of organized white fibrous tissue; (4) the applicability of the same procedure to other situations." The author's experiments upon dogs have shown that the tissue is not absorbed, does not slough, but heals *in situ*. In some women and in very young children the external oblique is occasionally so poorly developed as to make the application of the author's methods impracticable. The tensile strength of the strips of tendon is sufficient to stand a strain of from 11 to 24 pounds. Sufficient time has not elapsed since his operations to make the author's report final.

Tansini¹ presents some **improvements in the operation for the cure of inguinal hernia** brought about by the use of 3 new instruments and the employment of gold wire sutures. The instruments consist of a hook for the cord, a retractor, and a spatula, which instruments aid the operator in performing a radical cure with a minimum amount of handling and traumatism of the tissues. For sutures he uses small gold wire. Since using these instruments and the gold wire sutures Tansini has greatly lessened his percentage of infections and recurrences.

Thomas H. Manley² deals with **primary resection of the intestine in gangrenous hernia** and reports 2 cases of successful lateral anastomosis with the Connell suture. The author first reviews the history of intestinal anastomosis. Deverger in 1763 performed anastomosis with the aid of a desiccated segment of calf's trachea, the patient recovering, and the tracheal ring being passed per rectum on the twelfth day. To Senn is given the credit of doing the most to advance intestinal anastomosis. Manley is a strong advocate of lateral anastomosis by means of the Connell suture in preference to the end-to-end anastomosis, because in the former operation there is less likelihood of interference with the blood-vessels of the mesentery. He does not think that the method of Gregory Connell, in which the knots are turned in, is a great improvement over the suture of his father, M. E. Connell. The formation of an artificial anus in cases of gangrenous hernia is not considered by Manley to be as satisfactory an operation as immediate resection with anastomosis. He says that the time required for one operation is nearly as great as that required for the other. Whichever procedure is decided upon, the surgeon must see that a very free incision into the parts about the neck of the hernia is made. Such immediate improvement in the patient's condition usually follows the division of the constriction that in cases in which an anastomosis had probably not been thought of it may be that operation can be readily accomplished. The employment of the continuous Connell suture through all the coats of the intestine and a lateral anastomosis Manley believes to be the most satisfactory method of repair after resection of a gangrenous bowel. The greatest advantage of the lateral anastomosis is the preservation of an abundant vascular supply to the traumatized parts. This method also obviates the tendency to annular cicatricial contraction which may follow the circular enterorrhaphy. Two cases are reported, one in which the ileum was anastomosed to the cecum, and another in which ileo-ileostomy was performed. The author believes that it is necessary in all cases of resection to establish drainage from the seat of anastomosis in case any leakage should occur.

A case of **diaphragmatic hernia in which a strangulation of the stomach occurred** is reported by Mackenzie and Battle.³ The patient was a man 30 years of age who 7 or 8 years prior to his admission received a stab wound of the lower left chest in which, it was said, the stomach was exposed. The wound healed promptly and the patient had no trouble for 3 years, when he was seized with an attack of pain in the left side of

¹ *Gaz. Hebdomadaire de Méd. et de Chir.*, Mar. 27, 1902.

² *Med. Rec.*, July 27, 1901.

³ *Lancet*, Dec. 7, 1901.

the upper abdomen, accompanied by vomiting. Slighter attacks occurred later. Seven days before admission, while crossing the English Channel, the patient suffered from seasickness and continued to vomit almost constantly after he landed. He was admitted to the hospital in a state of extreme collapse, and only rallied after the intravenous injection of 3 pints of salt solution. The day following admission he was somewhat improved, although vomiting continued and he complained of great thirst. The temperature remained subnormal throughout this attack. Operation was determined upon, though the patient was in an extremely bad condition, his pulse being hardly perceptible. At the time of operation there was no displacement of the cardiac dulness and the apex was in the fifth interspace 1 inch internal to the nipple line. An incision was made below the left costal margin. The intestine, both large and small, was found collapsed and empty except the colon and sigmoid flexure, which contained scybalous masses. Upon examination an opening was found in the diaphragm occupied by a portion of the colon, a large portion of the stomach, and the great omentum. The colon was easily withdrawn. With some difficulty the stomach was withdrawn into the abdominal cavity, but it was not thought wise to attempt to separate the omentum, which was firmly adherent to the margins of the diaphragmatic opening; neither did it seem desirable to attempt to close the opening. The patient was extremely restless after the operation and complained of continued thirst, notwithstanding the administration of enemata of saline solution. He died 3 days after operation. At the postmortem peritonitis of the upper portion of the abdominal cavity was found, fluid occupied both pleuræ, and there was septic pneumonia of the base of the left lung. The opening in the diaphragm was $1\frac{1}{2}$ inches in diameter, was lined by omentum, and contained a portion of the colon, which, however, was not strangulated. Wilks first drew attention to the occurrence of torturing thirst in cases of strangulation of the stomach, and this symptom was prominent in the case reported. Other valuable symptoms of this condition are, pain referred to the upper portion of the abdomen, urgent vomiting, rapid emaciation, a boat-shaped abdomen, constipation, and the excretion of only a small quantity of urine. All these symptoms were present to a marked degree in the case reported. More than 300 cases of diaphragmatic hernia have been recorded, but the condition was rarely diagnosed during life. Llobet, Humbert, Leisrink, and Mikulicz have all operated with success in this condition. The diaphragmatic opening can best be closed by approaching it through the chest-wall.

Flaherty¹ reports a case of **diaphragmatic hernia following a penetrating wound of the thorax** occurring in a boy of 10. The boy was injured by a hay-knife which penetrated the thorax on the left side of the axillary line between the seventh and eighth ribs and came out posteriorly between the tenth and eleventh ribs, $1\frac{1}{2}$ inches from the spinous processes. The prominent symptoms presented by this case before death took place were marked tympany over the lower portion of the left

¹ Amer. Med., June 21, 1902.

chest, a soft abdomen, little or no pain, but great thirst and vomiting. On the fourth day after the injury the heart was completely displaced to the right of the sternum and tympany was present over the whole of the left thorax. The patient died on the morning of the fourth day. At the autopsy the stomach was found distended with gas and occupying the entire left pleural cavity, with the exception of a small space at the apex which was filled by the collapsed lung. The opening in the diaphragm was 3 inches in length. The great omentum had been carried through the opening with the stomach and the latter organ had been so twisted upon itself as to cause an obstruction of the cystic duct, which resulted in a marked distention of the gall-bladder. Leichtenstern has collected 250 cases of traumatic diaphragmatic hernia, and in but 5 of these was the diagnosis made before death.

Arthur E. Barker¹ reports a case of **strangulated femoral hernia** occurring in a woman 39 years of age. At the time of operation the intestine was found quite dark in color, but it had not lost its luster and improved upon irrigation with hot salt solution after a division of the constriction. The patient made an uneventful recovery except for some discomfort from flatulency. After she had recovered entirely from the operation she suffered from several attacks of intestinal obstruction, the interval between the attacks being several weeks. Three months after the operation the patient had a severe attack of intestinal obstruction, during which she barely escaped death. A second operation was decided upon; this was performed and a portion of the bowel which had been herniated was found to be so firmly matted that separation of the adhesions was impossible. Thirty-seven inches of bowel were therefore resected. The patient made a satisfactory recovery from the operation. The case shows the importance of early operation in strangulated hernia and illustrates the fact that, although the intestine may be in an apparently good condition, yet it may give rise to subsequent trouble after reduction. [This case resembles closely one operated upon by Gibbon at the Jefferson Medical College Hospital, Philadelphia. The patient was a woman 35 years of age, admitted for a strangulated femoral hernia. The bowel was black, but improved quickly after division of the stricture and irrigation with hot salt solution. At one point the bowel-wall seemed considerably thinned. With some hesitation the bowel was returned to the abdominal cavity and a radical cure operation was completed. The patient did well until about the eighteenth day, when she had some trouble in having a bowel movement; the pain and discomfort, however, quickly subsided upon the use of an enema. Similar symptoms recurred on the twenty-second day, and this time an enema gave no relief. Operation was decided upon. When the abdomen was opened, the previously herniated bowel was found matted together, and in the midst of the mass there was a collection of pus which was the result of an ulcerated perforation of the bowel. The abscess-cavity was apparently walled off, but the peritoneal cavity contained considerable straw-colored fluid. Separation of the adherent bowel could not be accomplished without

¹ Lancet, July 6, 1901.

considerable traumatism, and resection was decided upon. Eight inches of the small intestine were resected and an end-to-end anastomosis was accomplished with the aid of the O'Hara forceps. The perforation had occurred at the site of the former constriction. The abdominal cavity was irrigated and all deposits of lymph were removed from the intestines in the neighborhood. A gauze drain was introduced and the patient made a satisfactory recovery, and a number of months after the operation was perfectly well.]

C. A. Porter¹ reports a case of **strangulated hernia reduced en bloc** in which he performed a successful operation. The hernia was reduced under ether by the patient's physician, but the symptoms of strangulation were not relieved. Porter opened the abdomen through the right rectus muscle and found that in reducing the hernia the physician had converted it by manipulation into the properitoneal or interstitial variety, the sac and a portion of its contents being found between the parietal peritoneum and the transversalis fascia, and having no relation to the inguinal canal.

Bertram² reports 4 cases of **strangulated hernia** in which he was obliged to operate after a supposed reduction of the hernia by forcible taxis. So impressed has he become with the dangers of taxis in cases of strangulation that he has employed it but twice in 137 cases, resorting, in the remaining 135, to herniotomy. Two of the cases reported by Bertram were umbilical hernias occurring in women. In each of the cases reported resection of the bowel was necessary. [In one case in the Jefferson Hospital DaCosta removed a testicle which had been destroyed by squeezing and had been forced with the hernia into the inguinal canal. We believe that one effort at taxis is justifiable after a man comes to a hospital, and this should be brief and gentle, and the patient should be anesthetized. If it fails, operation should be immediately performed. Never try taxis if previous efforts have been made or if there is stercoraecous vomiting. Gibbon operated for symptoms of obstruction of the bowels 48 hours after the reduction of a strangulated umbilical hernia at the Jefferson Medical College Hospital. When the abdomen was opened, 8 inches of gangrenous small intestine was found and resected, the patient making a good recovery.]

A very complete discussion of **inguinointerstitial hernia** is presented by Berger.³ This term is applied to congenital hernia in the male complicated by an ectopic testicle and in which the protrusion occurs in the abdominal wall, and is enveloped by the musculoaponeurotic layers. There are two varieties of this form of hernia; in one the rupture is altogether intraparietal; in the other a diverticulum protrudes through the external inguinal ring, and therefore the hernia is both intraparietal and scrotal. Frequently the scrotal portion of the sac is so small that it is occupied by none of the abdominal contents. A frequent site of inguino-interstitial hernia is between the external oblique muscle and the fascia transversalis, the internal ring being displaced upward and outward;

¹ Boston M. and S. Jour., Oct. 10, 1901.

² Deut. med. Woch., Aug. 8, 1901.

³ Rev. de Chir., No. 1, 1902.

sometimes a portion of the sac is covered by fibers of the internal oblique muscle. The ectopic testicle varies greatly in its position and relation to the hernia. The testicle is usually undeveloped. Because of the great difficulty in reducing and retaining such hernias operation is strongly called for unless there be positive contraindications. The testicle should be removed in patients beyond 25 years of age unless a satisfactory orchidopexy can be performed. If the organ is undeveloped or atrophied, it should be removed. In young patients the testicle should always be saved if possible.

An interesting case of **hernia into the fossa duodenojejunalis** is reported by Bingel,¹ who also presents a summary of the literature of retroperitoneal hernias. The case reported is that of a man 58 years of age who was admitted to the hospital in a state of collapse, the condition being diagnosed general peritonitis. Death occurred 20 hours after admission. At the autopsy the abdomen contained a large quantity of blood-stained fluid and the coils of intestine on the right side were distended, infiltrated with blood, and covered with thin fibrous exudate. The left side of the abdomen was found to be occupied by a tumor reaching from the diaphragm to the pelvis. This tumor proved to be a large peritoneal sac containing numerous coils of intestine and their mesentery. The strangulation was brought about apparently by the escape of a coil of intestine from the sac.

The question of **tuberculosis herniosa and appendicitis tuberculosa** is dealt with by Andrews,² who presents a brief report of 2 cases of the former condition and 4 of the latter. Tuberculosis herniosa was first noted by Pitha in 1845. Reference is made to the other reported cases since this date, and special reference to 2 cases reported by Von Brackel, in one of which a diagnosis was made before operation. Andrews's first patient was a girl 23 years of age who for 2 years had had a left femoral hernia which was globular, tense, and irreducible. Operation showed a sac studded with fibrous nodules and containing only a yellowish serum. The opening into the abdominal cavity was so small as only to admit a probe. The whole sac was removed, but the general peritoneal cavity was not inspected. A diagnosis of localized tuberculosis was made, though microscopic examination was negative as to tubercle bacilli. The nodules, however, showed much round-celled infiltration and giant-cells. There was no tuberculous history before or after operation. The second patient was a man 47 years of age who presented a large right scrotal hernia, partly reducible. In this case the sac was very thick and was studded with many nodules and contained a rolled-up adherent mass of omentum. The fluid in the sac was clear and white and ran freely from the abdomen. The herniated intestine and omentum were covered with small tumors, some of which were as large as hazelnuts. The diagnosis was here made of exudative tuberculous peritonitis. The sac with the omentum was removed. The general peritoneum in this case showed extensive involvement. The patient was afterward lost sight of, but during his stay in the hospital for a number of weeks after the operation

¹ Arch. f. path. Anat., Bd. CLVII, Heft 1, 1902.

² Ann. of Surg., Dec., 1901.

he developed no ascites. A diagnosis of the condition before operation is peculiarly difficult, but the following points are mentioned as aiding diagnosis: "(1) No bowel in the sac, but some fluid; (2) sac distends with upright position; (3) sac refills quickly after emptying; (4) no gurgling felt or heard on taxis; (5) spontaneous return on lying down; (6) percussion note is dull; (7) sac feels thick and irregular; (8) sac often tender and inflamed. It may be stated that the condition is ordinarily no bar to operation. In fact, there may be every reason to operate early and radically in order to eliminate the disease if it be local." The following suggestions are made as to treatment: "(1) All cases, general or local, should be operated upon early; (2) all the sac and all the diseased omentum should be removed high up; (3) the repair seems good in these cases, and any radical cure method (except those of Macewen or Kocher, in which the sac is left) can be employed; (4) if hernia tuberculosa is found during operation, it would often be better to make a general laparotomy at once. If this cannot be done, a relaparotomy should be performed later."

The **features determining permanency of cure in radical operations for hernia** are stated as follows by Ochsner¹: "(1) The wound must heal primarily; (2) in order to avoid pressure necrosis the stitches must not be drawn tightly; (3) the edges of the surfaces to be united must be free from fat and other unstable tissues; (4) the tissues should be manipulated with the greatest care during the operation; (5) the wound should be supported by broad rubber adhesive plaster straps; (6) the patient should be kept in bed for 2 or 3 weeks; (7) after the operation abnormal intraabdominal pressure should be eliminated." The most important step in the radical cure of inguinal hernia consists in the thorough approximation of the internal oblique and transversalis muscles and Poupart's ligament. Care should also be taken in this operation to remove the sac well up into the peritoneal cavity. In femoral hernia after a high ligation and removal of the sac the best method of closing the femoral ring consists in a circular purse-string stitch applied around the edges of the ring. The secret of curing ventral hernia consists in thoroughly dissecting out the various abdominal layers and uniting them separately with supporting silkwormgut sutures passed down to, but not through, the peritoneum. Mayo's operation for umbilical hernia is strongly recommended.

Russell² discusses the **congenital factor in hernia**, expressing the conviction that all inguinal hernias are the result of a congenital sac, and that the muscular wasting and weakness are the result and not the cause of the condition. The laxity of the peritoneum plays an important part in the incidence of hernia, and to it is attributed the occurrence of direct inguinal hernia in young people. Reference is made to the frequency with which the bladder is drawn into the hernial sac, and its presence in this position is considered also secondary; it complicates the application of a ligature to the neck of the sac, but this can be overcome by carefully separating the two after the sac has been opened and the finger intro-

¹ Amer. Med., Nov. 30, 1901.

² Lancet, May 31, 1902.

duced. It is more difficult to treat a hernia of the sigmoid flexure than hernia of the bladder because of the former's much more intimate attachment to the peritoneum. This condition is frequently seen in adults, but seldom in children, Russell having seen it only once in 115 operations upon children, while in a small number of operations upon adults it occurred three times. Femoral hernia is generally considered an acquired hernia. To put it tersely, in femoral hernia it is the hernia that forms the sac; in inguinal hernia it is the presence of the sac that causes the hernia. The author made this statement 3 years ago, but has now changed his opinion as to the etiology of femoral hernia and believes it also to be the presence of a congenital sac in the crural canal.

After reporting his experience in 114 cases of **operation for the cure of hernia**, Geo. Heaton¹ discusses the **prognosis and treatment of hernia in childhood**, and concludes that cure, not palliation, should always be the aim of the surgeon in treating the hernias of childhood. A cure can be obtained in early childhood by a careful, potent, and persistent wearing of the truss, though it is probable that throughout life there will be a predisposition to relapse. If, after the proper employment of a truss, the hernia still persists, a radical cure should be performed and the patient not allowed to pass through life handicapped by such a disability as an uncured rupture.

R. E. Webster² reports an interesting case of **hernia of Meckel's diverticulum** occurring in a woman of 42. The patient was admitted to the hospital with symptoms of intestinal obstruction. Examination revealed a strangulated left inguinal hernia. When the sac was opened, a diverticulum measuring $3\frac{1}{2}$ inches in length was found arising from the ileum. The diverticulum was removed and the patient made a prompt and satisfactory recovery. In this case there was considerable inflammatory thickening of the ileum about the diverticulum where this portion of the bowel had been constricted in the inguinal ring.

J. Basil Hall³ reports an interesting case of **perforation of the appendix within a hernial sac, resection of the cecum, and ileocecal junction**, the patient making a satisfactory recovery. The patient was a man 23 years of age who first noticed the hernia 5 days before admission, when he was lifting a sack of flour and was seized with sudden acute pain in the right groin and became conscious of a large scrotal swelling. During the night the swelling disappeared, but reappeared the next morning. Operation was performed 10 days after the accident. The sac was found to contain a mass of intestine together with lymph, disorganized blood-clot, and pus. The appendix presented a perforation near its base, through which exuded pus and fecal matter, and also two small concretions. The cecum was so infiltrated and softened and was so thoroughly septic that its excision was determined upon. This was done and an anastomosis made with the Murphy button. The patient made a satisfactory recovery, the button being passed on the seventeenth day. Hall refers to 8 cases which he has collected from literature in each of which a perforated appendix was found in a hernial sac.

¹ Quarterly Med. Jour., Aug., 1902.

² Ann. of Surg., April, 1902.

³ Brit. Med. Jour., June 28, 1902.

Another interesting case is reported by R. C. Turk¹ of a man 78 years of age who suffered from a **right cecal hernia complicated by hydrocele and suppurative appendicitis**. The appendix, the testicle, and the sac were removed *en masse*. A large amount of omentum was also removed and the intestines were returned to the abdominal cavity. Some suppuration took place in the wound, but the patient made an uneventful recovery.

The subject of **strangulated hernia in infants**, with a report of a third case successfully operated upon, is presented by Chas. N. Dowd.² The case reported is that of a boy 3 months and 10 days old. Two weeks before admission the hernia had remained down for 2 days, but was then reduced by taxis. The hernia returned 2 days before admission; the child became cross and peevish and began to vomit. On the next day the vomiting was stercoraceous and there was intestinal obstruction. On the day of admission the hernia had again disappeared; but as the child's condition did not improve, he was brought to the hospital. No evidence of hernia could be discovered, but as there was no improvement in symptoms Dowd operated and found a small portion of the bowel strangulated at the external ring. The child was in bad condition while on the table and stercoraceous vomiting continued after the relief of the constriction, therefore a complete radical cure was not performed. The child made an uneventful recovery. A year after the operation the patient presented a recurrence of the hernia, which, however, could be controlled with a truss. This fact tends to refute the statement that the simple high ligation and removal of the hernial sac is sufficient to establish a radical cure in children. Dowd refers to the literature of strangulated hernia in children and comments on the wonderfully good results obtained by operation.

DISEASES OF THE LIVER, GALL-BLADDER, AND SPLEEN.

The subject of **tropical abscess of the liver** is discussed at considerable length by Godlee,³ who details 10 cases which he has treated. Perihepatitis is nearly always a complication of tropical abscess, results in adhesions of the liver to the parietes, and produces an acute pain which is distinct from the typical liver pain. Prior to the adhesion of the liver friction can be felt and heard over the inflamed area. The introduction of an exploring trocar or aspirating needle is dangerous unless this perihepatitis with adhesion has taken place. Inflammation of the peritoneum covering the liver, accompanied by fever and vomiting, often occurs in definite attacks, and usually affects the convex surface of the liver; consequently adhesion to the diaphragm most frequently occurs. Perihepatic peritonitis does, however, sometimes occur on the under-surface of the liver, causing the stomach, duodenum, and colon to become adherent, and resulting not infrequently in subsequent contraction which may give rise to considerable interference with

¹ Jour. Am. Med. Assoc., April 26, 1902.

² Med. Rec., Oct. 11, 1901.

³ Lancet, April 24, 1902.

these organs. If the inflammation occurs in the transverse fissure, compression of the hepatic ducts is produced, with resulting jaundice. The author refers to such a case in which he found it impossible to free the common duct from the adhesions and was obliged to perform a cholecystenterostomy. In this case for a time the whole amount of bile escaped through the liver abscess, an occurrence which is rare in the tropical form of this disease. The author lays great stress upon the importance of exploring the liver without delay when in the course of an abscess a marked pleural friction develops; such friction usually signifies approaching rupture into the lung. An abscess of greater or less extent must form in the lung-tissue in every case of rupture into the lung. The signs of cavity formation will be met with most frequently below and to the inner side of the right nipple, although not infrequently they may be noted behind, and in a few instances a liver abscess has burst into the left lung with the formation of a cavity there. The author asserts that lung abscesses of liver origin do not behave as do those from pneumonia, injury, or tubercle, but show a peculiar tendency to burrow and destroy large areas of lung-tissue. The pus discharged from a secondary lung abscess frequently contains *Amœba coli* and is chocolate-colored. Such discharge often keeps up after the liver abscess has completely healed with little or no trace remaining in the liver-substance. Not infrequently *Amœba coli*, although absent at first in the discharge of a liver abscess, is found later. Pulmonary abscess consequent upon hepatic abscess should be opened without delay. Godlee refers to the great latency of tropical abscess of the liver, developing even years after the patient has left the tropics. Such latent abscess, however, may suddenly become acutely septic as the result of infection with the colon bacillus or some other septic organism. Some tropical abscesses of the liver also are acute and septic from the beginning, and it is thought that these should be classed by themselves. The method best suited to the thorough evacuation of most liver abscesses is as follows:

If two lines are drawn vertically downward, prolonging the anterior and posterior folds of the axilla as far as the margin of the ribs, they will at the lower part inclose the space where the widest interval intervenes between the lowest part of the pleura and the costal margin, an interval generally of 2 inches and often even more. The incision may conveniently be made transversely,—that is, parallel with the lower margin of the pleura,—and the portion of one rib and cartilage that crosses the wound obliquely should be removed, great care being taken to separate the structures on the deep surface of it without injuring the pleura in case by chance this membrane extends lower than usual. Generally the structure thus exposed consists only of the origin of the diaphragm; but if the pleura should be low, it is easily recognized, and may, without any difficulty, be dissected up without injuring it, and be fastened out of the way to the upper part of the wound. If it should accidentally be opened, the suture of the opening is a simple matter, and it is essential to make it perfectly air-tight before proceeding. The remainder of the operation consists in incising the diaphragm, either in

the direction of the fibers or across them [the author prefers the former method], and then cutting through the diaphragmatic peritoneum. If there be no adhesions, the liver may either be sutured to the diaphragm and the chest-wall or the parts around the opening may be carefully plugged with some antiseptic material. When the latter course is adopted, it must not be forgotten that, if the abscess be large, the liver will at once shift its position, and that this shifting will take place in the upward direction. This method is much to be preferred to the one of opening the abscess behind, since the latter operation must necessarily be a trans-pleural one; the anterior operation is the only possible one in certain abscesses of the right lobe and in all those of the left. By means of hemostatic forceps the abscess may be opened after the liver is exposed. The bleeding, although usually free at first, can be controlled with packing about the tube. Profuse hemorrhage is more likely to occur in the septic cases than in the truly amebic ones.

An interesting case of **multiple abscesses of the liver secondary to a perforating ulcer of the stomach** is reported by Fasken,¹ of the British Navy. The patient was a seaman who had suffered from abdominal pain at intervals for about 2 years. He was admitted to the hospital with fever, an enlarged liver, and jaundice. The patient after admission developed rigors, the temperature increased, the liver became larger, and 4 exploratory punctures were made, 2 anteriorly and 2 posteriorly, for the purpose of locating pus, but none was found. The patient died, and at the postmortem a circular ulcer the size of a half-crown was found on the anterior surface of the stomach near the esophageal end. A fistulous tract connected the site of the ulcer with an abscess about the size of a hen's egg in the right lobe of the liver close to the gall-bladder. The liver was greatly enlarged and studded with small abscesses. The abscess-cavity in connection with the stomach was filled with food material. The viscera in the upper part of the abdominal cavity were firmly matted together by adhesions. [This case illustrates the unsatisfactory result often obtained by the use of the exploring needle.]

Kobler² analyzes 79 cases of **abscess of the liver**, 31 of which occurred in connection with obstruction of the bile-ducts. Of these 31, 23 resulted from gall-stones; 7 from carcinoma; 1 from *Ascaris lumbricoides*; 17 were secondary to some lesion in the portal area, 6 arose from disease of the female genital organs, 4 from dysentery, 3 from typhlitis, 1 from pancreatic abscess, and 1 from suppurating hemorrhoids. In 13 cases pyemia was the cause of the condition. Pyemic abscesses are notably less frequent than in the pre-antiseptic days. In 8 cases echinococcus cysts were responsible for the abscess. Kobler shows that it is a mistake to take the conclusions as to the cause of liver abscess from the statistics of any one locality. The cases he reports are taken from the Institute of Pathology and Anatomy at Vienna. In other statistics dysentery as a cause of liver abscess will be found much more frequent.

¹ Lancet, May 31, 1902.

² Virch. Archiv, Bd. CLXIII, Heft 1, 1901.

Eliot¹ deals with the subject of **abscess of the liver** and gives a report of 3 cases upon which he has operated. Secondary abscess of the liver is the result of transmission of infectious material, usually an infected thrombus from an inflammatory field drained by the portal system. Infection may take place also by the passage of a pyogenic embolus through the hepatic artery. Infection by continuity along the bile-ducts is not a frequent mode. Liver abscess may also occasionally originate from an infection of an echinococcus cyst and through the lymphatic system. In addition, a so-called primary abscess of the liver may occur in which no source of infection can be discovered. Often the probable source of infection has disappeared when the abscess of the liver is discovered; this is frequently illustrated in cases of liver abscess following ulceration of the bowel. The pathologic condition of liver abscesses varies according to the cause which produces them. A dysenteric abscess is usually single, and a pyemic abscess is usually multiple. Multiple abscesses may develop simultaneously, presenting the same degree of pathologic change, or a considerable interval may intervene between the abscess formations, even sufficient length of time for convalescence to become established. Richelot reports a case of a patient who had 3 operations for as many abscesses in different parts of the liver, each operation being followed by convalescence. In the third case reported by Eliot the walls of the different abscesses were identical. The author suggests the employment of the exploring needle as a possible cause of multiple abscesses. For instance, the needle, although it may not have been introduced sufficiently far to withdraw pus, at the same time may have gone far enough to have become infected; and if it is then withdrawn and introduced into a different portion of liver-tissue, it is not improbable that abscess may be here set up. Because of this danger it is suggested that a freshly sterilized needle should be employed for each exploration. The symptoms of abscess of the liver vary according as to whether the abscess is primary or secondary. When secondary, the symptoms of the original disease are accompanied by those of abscess. Pain of varying character is one of the early symptoms of abscess of the liver. The classic scapular neuralgia, which is indicative of liver abscess, is not observed until the abscess approaches the diaphragmatic surface of the liver. The pain is intensified by any movement which disturbs the liver; deep inspiration, for instance. Perihepatitis may develop while the abscess is yet deep within the liver-substance. This fact is illustrated in the author's first case, where, although the peritoneum was found adherent over an area about the size of a dollar, the pus was found at a depth of $2\frac{1}{2}$ inches in the liver-tissue. In discussing the other early symptoms of abscess of the liver, Eliot refers to the suggestion of French surgeons to observe the movement of the diaphragm with the x-ray. It is said that when this is done the movements of the right side of this muscle will be found to be markedly impeded. A beginning perihepatitis is apt to give rise to a fremitus which is peculiar to the condition. A persistent leukocytosis

¹ Ann. of Surg., Oct., 1901.

in the presence of other symptoms is of considerable value. In the three cases reported it varied from 10,000 to 19,000. When the second stage of liver abscess is reached, a diagnosis is much more readily made, as then the physical signs are well marked and positive. Eliot does not favor the employment of the exploring needle until the liver surface has been exposed through an incision and everything is at hand and ready for the completion of drainage. Drainage may be obtained through one of three operative procedures, as follows: (a) transpleural, anterior and posterior; (b) subpleural, anterior; (c) transperitoneal, anterior and posterior. The selection of the operation must depend upon the situation of the abscess. In cases where there is doubt as to the situation of the abscess the anterior transperitoneal method offers the best results. If, after opening the abdomen, it is found that the abscess can best be drained through one of the other routes, the abdominal incision should be closed and the operation indicated performed. Care must be taken to protect the pleural and peritoneal cavities in operations through them by careful packing or suturing. In the three cases reported Eliot performed the anterior transperitoneal operation. In these cases after the abscess was located by the exploring needle the peritoneal cavity was shut off by sutures and slow drainage allowed to take place through the needle, which was fixed in the abscess by means of adhesive strips attached to the skin, for 4 or 5 days, when firm union between the liver and the parietal peritoneum had taken place, and then the abscess was thoroughly drained after incision with the cautery knife. Eliot suggests the employment of the posterior transperitoneal operation for abscesses deeply seated in the right lobe, and has not been able to find in literature any case reported in which this operation was chosen. Of the 3 cases reported by Eliot, 2 were single abscesses. Both of these recovered, and the third case was discovered postmortem to be one of multiple abscess.

After dealing with the literature of the **surgical treatment of ascites due to cirrhosis of the liver**, Harris¹ presents a report of two patients operated upon and reaches the following conclusions: "(1) While the increased tension in the portal system is an important factor, it is not the only one concerned in the production of ascites. (2) Talma's operation in itself is quite simple and practically devoid of danger, as the deaths have been due to complications or to the advanced stage of the disease. (3) As the chronic inflammatory changes in the peritoneum are materially instrumental in maintaining the ascites, the operation should be performed early, in a pre-ascitic stage if possible, in order that the reduction of tension in the portal system may delay the appearance of these changes, and secondarily the ascites, as long as possible. (4) In a few cases the ascites has apparently been favorably influenced by the operation, but such has not been the rule, nor does it appear that the operation has in any way modified the usual course of the disease."

Roe and Spencer² report a case of **ascites due to hepatic cirrhosis treated by transplantation of the omentum between the peritoneum**

¹ Jour. Am. Med. Assoc., May 3, 1902.

² Phila. Med. Jour., Mar. 1, 1902.

and the abdominal wall. The patient was a woman 42 years of age who suffered from syphilitic atrophic cirrhosis. Prior to operation Roe had performed paracentesis 31 times. Repeated examinations of the patient's urine previous to and at the time of operation failed at any time to show albumin or casts. The abdomen was opened; the parietal peritoneum was divided transversely and at right angles to the median incision and separated from the transversalis fascia; the omentum was then fixed by sutures through the abdominal wall into the space made between the peritoneum and transversalis fascia. The patient after the operation showed considerable improvement and lived 8 months. Subsequent to the operation paracentesis was performed 20 times. At the autopsy the omentum was found to be firmly fixed where it had been placed. It is stated that this patient died 2 months after she had reached the condition in which she was found at the time of operation, and that therefore it is thought that her life was prolonged probably 6 months. Histologic examination of the liver confirmed the diagnosis.

A. F. Jonas¹ reports 2 operations for **gall-stones** in which marked **ptosis of the liver** was observed, the organ being displaced downward and inward. After he had relieved the condition for which he operated he replaced the liver without difficulty and fastened the gall-bladder to the upper angle of the wound, thus firmly holding the liver in position. An examination of both patients was made a considerable time after the operation, but no reproduction of the liver displacement was discovered in either. Gastropptosis and enteropptosis were associated with the descent of the liver in the second case. The abdominal wall after this operation should be firmly supported for a considerable period by an abdominal band, otherwise the gall-bladder attachments are apt to become elongated. Jonas, after discussing the question of liver prolapse, draws the following conclusions: (a) Hepatopptosis is caused by a modification of one or more of the normal hepatic supports, or by an increase in the size and weight of the liver. (b) It is impossible for the liver to descend without producing a descent of the hollow abdominal viscera. (c) It seems practical to utilize the gall-bladder as a suspensory ligament to maintain and hold in normal position a prolapsed liver together with certain other abdominal organs. [In an operation for gall-stones at the Jefferson Hospital, DaCosta encountered exactly the condition described by Jonas and utilized the gall-bladder as a suspensory ligament. In another case in the same hospital Gibbon did the same. In Gibbon's case the liver showed no enlargement, but its lower edge extended at least 4 finger's-breadths below the costal border. In another case, that of a man upon whom Gibbon operated at the Polyclinic Hospital, Philadelphia, the symptoms complained of by the patient were largely those of gastropptosis, and an operation was decided on for the relief of this condition. The possibility of gall-stones being considered, the incision was made along the right edge of the rectus. The liver and stomach were found much prolapsed and a small single stone was discovered in the gall-bladder. The liver was replaced and its round

¹ Jour. Am. Med. Assoc., Mar. 29, 1902.

ligament and the gall-bladder were sutured to the upper angle of the wound. We think that ptosis of the liver is much more commonly associated with gastropotosis than is generally supposed.]

Ninety-eight cases of floating or movable liver which have been reported are referred to briefly by J. H. Carstens,¹ and he reports a case upon which he operated for this condition. The patient was a woman 48 years of age who weighed 220 pounds, and the thickness of the abdominal wall prevented a diagnosis of the condition. When the abdomen was opened, the right lobe of the liver was prolapsed as far as the brim of the pelvis. The liver was replaced with ease, a portion of its surface was denuded, a corresponding area of parietal peritoneum was denuded, and the coronary ligament was sutured to the upper angle of the wound. The symptoms greatly improved after the operation. Carstens is convinced, after an examination of the literature of the subject, that injury is the cause of the condition in nearly every case, although occasionally a malignant growth will produce it. The symptoms usually complained of are distress and a feeling of weight in the region of the liver. Tympanites and intestinal indigestion frequently occur and nervous symptoms are very marked and of great variety. Tight bandaging usually gives some relief.

After discussing the **surgery of the liver**, and dealing particularly with the question of hemostasis, Carl Beck² reports a case in which he removed a very large pedunculated angioma from the left lobe of the liver of a colored man 20 years of age. Beck also reports the result of a number of experiments upon animals which he has conducted, and reviews the various methods which have been proposed for controlling bleeding in operations upon the liver. In the case reported hemorrhage was controlled by an elastic ligature and the stump was treated extraperitoneally. The patient made a good recovery. Beck recommends, however, that broad and long flaps of fascia and peritoneum attached at one end can be utilized for the support of mattress-sutures through the liver-substance in a perfectly satisfactory manner in animals, and concludes as follows: (1) Liver-tissue of considerable size may be safely removed by previous anemization of the part which is intended to be removed. (2) For the support of the ligatures living tissue from the same animal, preferably the fascia and peritoneum from the abdominal wall, is best suited. (3) The intraperitoneal or the intraparietal method is preferable to the external method.

A. Jeffreys Wood³ reports an interesting case of **multiple hydatid cysts** occurring in a girl 10 years of age. The patient came under Wood's care with a history of having suffered from hemoptysis for 2 years. Three months later, during an attack of measles, she coughed up a large number of small hydatid daughter-cysts and some pieces of a mother-cyst. A month later expectoration had almost ceased, but a year later the patient was admitted to the hospital with a prominent swelling over

¹ Jour. Am. Med. Assoc., May 17, 1902.

² Jour. Am. Med. Assoc., April 26, 1902.

³ Intercol. Med. Jour. of Australasia, Oct. 20, 1901.

the hepatic region. Wood opened the abdomen and exposed a large hydatid cyst on the anterior surface of the right lobe of the liver. After fixing the liver to the abdominal wound the mother-cyst was removed and the cavity closed without drainage. The following day it was necessary to reopen the wound because of distention of the former cyst-cavity with almost pure bile. Bile flowed from the wound for 12 days in enormous quantities. An attempt was then made to plug the wound and arrest the flow. The patient died rather suddenly. At the post-mortem it was found that death was due to the rupture of a large cyst which occupied the posterior part of the left lobe of the liver. At the site of the former cyst only a small amount of bile was found. A third unruptured cyst projected downward in front of the gall-bladder. A large piece of hydatid cyst was found in the apex of the right lung.

Wilms¹ discusses the **symptoms, prognosis, and treatment of rupture of the liver**, and reports a collection of 19 recorded cases. Of these patients, 4 died after operation, the postmortem revealing severe lesions of other structures, such as the ribs, diaphragm, and kidneys. In one patient the gall-bladder had become entirely separated from the liver, and in another a piece of liver structure was found in the right auricle. In 4 fatal cases laparotomy was done but no local treatment was applied to the rupture. In these cases such extensive lesions of other organs were found as to preclude the possibility of any advantage accruing from further surgical interference. In one case which proved fatal after laparotomy the spleen was found ruptured and was removed, and in another case both the kidney and spleen were removed. Another fatal case presented ruptures of the intestine, omentum, mesentery, and duodenum as well as of the liver. A fracture of the ribs with involvement of the pleura was present in a number of cases. Of the 19 patients, 3 recovered after operation. In 2 of these the wound was packed with gauze. One had an uneventful recovery, and the other recovered after free drainage of bile from the wound. Wilms finds that the most frequent causes of rupture of the liver are crushes between cars and those produced by carriages.

Mercadé² urges **early intervention in cases of injury of the liver** and reports 2 successful cases of his own. Out of 543 cases of rupture of the liver, more than one-half have died from hemorrhage within 24 hours. When an injury of the liver is suspected, the abdomen should be opened as soon as possible. After referring to the various methods of controlling hemorrhage from the liver, the author states that suturing and gauze tamponage are the two methods which will be found most satisfactory. The thermocautery has only been used twice, and is liable to cause secondary hemorrhage. It makes little difference whether interrupted or continuous sutures are employed, but the edges of the wound must be approximated. When the wound is a contused one, gauze packing is the best treatment. Drainage is considered essential in these cases and the intravenous injection of salt solution is a material aid in saving life. The first case reported, that of a man 38 years of

¹ Deut. med. Woch., Nos. 34 and 35, 1901.

² Rev. de Chir., Jan. 10, 1902.

age, is one of a stab wound of the liver. The point of entrance was in the median line about 5 cm. above the umbilicus, and from the wound a portion of omentum protruded. Laparotomy was performed in this case $1\frac{1}{2}$ hours after the receipt of the injury. A long wound was found in the convex surface of the left lobe of the liver; the edges of this wound were approximated with 3 catgut sutures and a gauze compress was placed between the abdominal wall and the injured surface. The patient made an excellent recovery. In the second case, that of a boy 16 years of age, the injury was produced by a wagon running over the patient. It was thought in this case that the spleen was ruptured, and the abdomen was opened in the median line above the umbilicus. The spleen was found normal. A rupture about 4 inches in length was found involving the lower surface of the liver. Access to the wound was very difficult; however, the author succeeded in closing it by a continuous suture, over which was placed a firm pad of gauze. The operation in this case was done about $2\frac{1}{2}$ hours after the injury. This patient also made a satisfactory recovery. In each case the intravenous injection of salt solution was employed immediately after operation.

Wm. J. Mayo¹ presents an analysis of 328 operations upon the **gall-bladder and bile-passages** performed by himself and C. H. Mayo between the years 1891 and 1902. In 311 nonmalignant cases there were but 8 deaths, making a mortality of 2.5 %. In 17 malignant cases there were 3 deaths, a mortality of nearly 18 %. In 214 cases stones were located in the gall-bladder or cystic duct or both, and among these cases there were 2 deaths. Because of the postoperative symptoms complained of in cases when stones have been removed from the cystic duct, and in which this duct has been obstructed, and because of the frequent necessity of doing a second operation in these cases, Mayo has concluded that if stones have been lodged in the duct for any length of time the operation of cholecystostomy is insufficient, and that the gall-bladder should be extirpated at the primary operation if the patient is otherwise in good condition. When cholecystostomy alone is performed in these cases, there is apt to be an insufficient drainage of the gall-bladder, due either to stricture or valve formation. In many cases the discomfort arising from this condition is slight and passes away, but in a large number the symptoms are more or less permanent in character. Nearly half of the cholecystectomies performed in the present series were secondary to the operation of cholecystostomy. In many instances it is easier to remove stones in the cystic duct with the gall-bladder than to remove the stone through this organ. Mayo advises after separating the gall-bladder from the liver that the peritoneal and muscular coats be divided at the neck and the mucous membrane of the duct stripped out, bringing the stone with it. Any adhesions which may be present do not involve the mucous membrane, therefore this operation can be carried out with little difficulty. The drains in such a case should be tied to the stump with fine catgut to prevent displacement and be surrounded with rubber tissue to prevent adhesion

¹ Ann. of Surg., June, 1902.

to the stomach. In many cases the stripping of the mucous membrane at the cystic duct is unnecessary, it being easier to remove the whole gall-bladder. When an infective cholangitis exists, the cystic duct can be left open for drainage by attaching a tube to its outer coats. In most cases, however, there is no infection of the hepatic and common ducts, and in such cases drainage is unnecessary if the gall-bladder and cystic duct are removed. Out of 33 cholecystectomies but 1 death has occurred, and this is attributed by Mayo to the ligation of the cystic duct in the presence of a cholangitis. It should have been drained. It is thought that the operation of cholecystectomy will, in a great number of cases of gall-stones, supersede that of cholecystotomy.

In 13 cases the stones were found outside of the gall-bladder and biliary passages in various situations; no deaths occurred in these cases. A study of them leads to the belief that stones passing by ulceration and perforation from the gall-bladder and cystic duct to the intestine do so slowly, and that often, if not usually, cicatrization takes place behind the stone before it is extruded into the intestine. In 2 of the cases the gall-bladder had become adherent to the abdominal wall and a fistulous opening had been established.

In the 34 cases of cholecystitis 5 deaths occurred, which attracts attention to the serious nature of this condition. In the so-called catarrhal cases cholangitis was more frequently met than in those in which there was an obstruction by stone or otherwise of the cystic duct and the infective process confined to the gall-bladder itself. Cholecystitis with or without obstruction of the cystic duct is considered the most dangerous condition for which the surgeon is called upon to operate. The danger of this condition lies in the tendency to progressive infection of the ducts. In acute infections of the gall-bladder and its ducts little manipulation should be practised and quick drainage established. When the duct is obstructed in these cases, it is thought wiser to leave its removal to a second operation or else to remove the entire gall-bladder. So much has Mayo been impressed by the idea that a dependent fundus predisposes to the formation of gall-stones that he believes one of the reasons why stones seldom form again after drainage of the gall-bladder is due to the fact that the fundus is permanently elevated by attachment to the abdominal wall. Two cases of acute suppurative cholecystitis followed typhoid fever; one occurred during the third week and the other in the fifth week. In each case a pure culture of the typhoid bacillus was found and the patient's blood gave the Widal reaction. In both cases the gall-bladder contained gall-stones, but these had been present long before the attack of typhoid fever. A history of typhoid fever was obtained in so few of Mayo's cases that he is inclined to think that typhoid fever as an etiologic factor in the production of gall-stones has been overestimated. In performing cholecystostomy Mayo's custom is to drain the gall-bladder by means of a rubber tube about the size of a lead-pencil, surrounded by gauze and held in the gall-bladder by a purse-string suture so placed as to invert the edges of the gall-bladder incision. The gall-bladder is then fixed to the parietal peritoneum,

or, if it cannot be brought to this position, a few strips of gauze are attached to it by means of catgut sutures and these are brought out of the wound. It is not thought wise to break up adhesions beyond a point necessary to explore the ducts and manipulate the fundus unless the gall-bladder is to be removed.

Stones in the common duct were met in 31 cases; among these there was 1 death. In only one of these cases was it found possible to remove the stone through a dilated cystic duct. In 2 cases the cystic duct was torn loose from the common duct, leaving an irregular opening, which was closed by a plastic operation consisting in a transplantation of a portion of the gall-bladder denuded of the mucous membrane except at one point, at which enough was left to fill the gap in the cystic duct. The outer coats of this portion of the gall-bladder were then wrapped around the common duct and held by a few catgut sutures and a light gauze packing. In both of these cases the external flow of bile was slight and ceased in a few days. In most of the 31 cases the stones found in the common duct were movable; in two-thirds of the cases more than one stone was present and in one case 27 stones were found. The typical ball-valve stone of Fenger was encountered 7 times. When more than one stone is present in the cystic duct, Mayo's rule is to dilate the duct sufficiently to permit of digital exploration. It is only by this means that the operator can be sure that all stones have been removed. In 5 cases stones were present in the hepatic duct, but these were movable and were extracted through an incision in the common duct. A fecal fistula from the duodenum occurred in 2 cases in which extensive ulceration had taken place: one patient recovered and the other died from inanition. In a number of the cases of common-duct stone the head of the pancreas was found enlarged, and in these cases more or less pancreatic secretion passed out with the bile, producing a considerable excoriation of the skin and giving to the discharge a peculiar odor. Jaundice was found to be a most variable symptom in these cases. Mayo's experience tends to prove the truth of Courvoisier's observation that jaundice from stone in the common duct is accompanied by a contracted gall-bladder which cannot be palpated externally in 80 % of the cases.

Jaundice as a cause of postoperative hemorrhage was met in a number of Mayo's cases, in 3 the oozing being a most serious postoperative complication. For one year he has followed Robson's plan of administering chlorid of calcium as a prophylactic in the jaundiced cases, but is uncertain as to its value. During this period, however, he has had no deaths from hemorrhage. Those cases in which there was a marked jaundice with subcutaneous ecchymotic spots before operation died. In most of these cases the obstruction was due to malignant disease. It is Mayo's custom after removing stones from the common duct to close the incision in the duct with a continuous catgut suture, providing the duct is in good condition and no fragments of stone or other detritus are left behind; otherwise the duct is only partly closed and drainage is established. If the patient is in bad condition, no attempt at closure should be made. In the present series of cases cholecys-

tenterostomy was performed 3 times for chronic pancreatitis and 3 times for malignant disease. The gall-bladder was attached to the duodenum twice and to the transverse colon 4 times. Apparently the anastomosis with the colon answered every purpose, although, of course, the duodenum is the ideal site for the anastomosis. It is not always possible, however, because of adhesions, to reach this portion of the bowel. Mayo employed the Murphy button in all his cases. In cases in which an exploratory operation reveals apparently only a contracted and adherent gall-bladder a careful search of the common duct should be made before deciding that the adhesions alone are the cause of the symptoms. In 12 cases out of the 328 an error in diagnosis was made. In most of these cases the real difficulty was found to be an old appendicitis or an ulcer of the stomach, although in one case a stone in the right ureter was found, and in another a small ovarian dermoid with a long twisted pedicle. Mayo, in exposing the biliary tract, makes a straight incision through the rectus muscle, which may be enlarged at the top or bottom after the method of Bevan, with the modification suggested by Weir. In none of the fatal cases of this series was death due to peritonitis. The deaths in the malignant cases were due to capillary hemorrhage. Stones were present in all of the malignant cases in which the gall-bladder and ducts were explored.

A. W. Mayo Robson¹ discusses the **surgical treatment of obstruction of the common bile-duct** by gall-stones and devotes particular attention to the operation of **choledochotomy**, referring briefly to 60 cases in which he has performed this operation. In an experience of several hundred cases of cholelithiasis Robson has found the common bile-duct to be involved in 1 out of every 5 or 6 cases. In 10 instances he was able to manipulate a concretion back into the gall-bladder and then extract it with a scoop; this, however, can be done only when the cystic duct is dilated. It is thought inadvisable to attempt to force a stone from the common duct into the duodenum, because it may become lodged in the diverticulum of Vater. In patients too old or too ill to bear choledochotomy, cholecystotomy may be performed, and is an operation which relieves the jaundice and renders possible the use of solvent injections. Stones in the common duct have been crushed by the pressure of the finger and thumb in some 30 instances by the author, but it is thought that fragments are apt to be left behind which may give rise to further trouble, and the method is only advisable in the case of soft concretions. Cholecystenterostomy or short-circuiting the obstruction is not advised for gall-stones, as it does not remove the cause of the trouble and the opening formed is apt to contract and lead to a speedy recurrence of the trouble. Robson has abandoned this operation entirely in these cases. A union between the gall-bladder and the colon is an easier operation, and is applicable when the patient is very ill, giving quite as satisfactory results as that of uniting the gall-bladder to the duodenum. It is applicable, however, only when the gall-bladder is distended, which is rare in gall-stones. Robson has 3 times successfully

¹ Lancet, April 12, 1902.

united a dilated duct to the intestine or drained it on to the surface. The plan of reaching a common duct through an opening in the duodenum, as suggested by McBurney, he has performed a number of times, but has lately abandoned the method because of the danger of sepsis, and because he himself has devised what he considers a simpler and safer method of removing the stone. He has performed the McBurney operation 11 times with 3 fatalities.

"Lastly, and most important, we come to the ideal operation for the removal of stones from the common duct, choledochotomy, which, after experience of all other methods in vogue for the removal of gall-stones from the common duct, I have come to the conclusion is the only one to be relied upon, and as an operation is therefore worthy of special study. Moreover, as the result of my experience in 60 cases I have been able to modify the operation in such a way that what was formerly a most difficult procedure, involving prolonged manipulation, special appliances, and at least two assistants, and only to be undertaken after all other means had failed, is now a comparatively simple operation in the greater number of cases, only requiring the help of one assistant and not requiring the use of any special apparatus. By this method the time involved in the operation is reduced considerably, and where adhesions do not give unusual trouble it is easy to complete the work in from 30 to 40 minutes, which not only means a saving of time and fatigue to the operator, but a considerable saving of shock to the patient. I always employ a firm sand-bag under the back opposite the liver, which not only pushes the spine, and with it the common duct, forward so that it is several inches nearer the surface, but acts like the Trendelenburg position in pelvic surgery by letting the viscera fall away from the field of operation. I then make a vertical incision over the middle of the right rectus, the fibers of which are separated by the finger, which I find to be the most expeditious and the most effective method of exposing the gall-bladder and bile-ducts; but when it is necessary to open either the common duct or the deeper part of the cystic duct, instead of prolonging the incision downward, as was formerly done, I now carry it upward in the interval between the ensiform cartilage and the right costal margin as high as possible, thus exposing the upper surface of the liver very freely. It will now be found that by lifting the lower border of the liver in bulk (if needful, first drawing the organ downward from under cover of the ribs) the whole of the gall-bladder and the cystic and common ducts are brought quite close to the surface, and as the gall-bladder is usually strong enough to bear traction, the assistant can take hold of it by fingers or forceps and by gentle traction can keep the parts well exposed, at the same time that, by means of his left hand with a flat sponge under it, he retracts the left side of the wound and the viscera, which would otherwise fall over the common duct and impede the view. It will now be observed that, instead of the gall-bladder and cystic duct making a considerable angle with the common duct, an almost straight passage is found from the opening in the gall-bladder to the entrance of the bile-duct into the duodenum, and if adhesions have been thoroughly separated, as

they should always be, the surgeon has immediately under his eye the whole length of the ducts with the head of the pancreas and duodenum. So complete is the exposure that if needful the peritoneum can be incised and the common duct can be separated from the structures in the free border of the lesser omentum, but this is not necessary except where a growth has to be excised. The surgeon, whose hands are both free, can now with his left finger and thumb so manipulate the common duct as to render prominent any concretions, which can be cut down on directly, the edges of the opening in the duct being caught by pressure forceps. The assistant can now take hold of the forceps with his left hand, as that instrument with the sponge will form a sufficient retractor since the duct is so near the surface. When the duct is incised, there is usually a free flow of bile, which, it must be remembered, is probably infective, but a sponge in the kidney pouch and rapidly mopping up the bile as it flows by means of sterilized gauze pads avoid any soiling of the surrounding parts, and if thought necessary the bulk of the infected bile can be drawn off by the aspirator, either from the gall-bladder or from the common duct above the obstruction before the incision into the duct is made. After removing all obvious concretions the fingers are passed behind the duodenum and along the course of the hepatic ducts to feel if other gall-stones are hidden there, and a gall-stone scoop, the only special instrument that I use, is passed quite up into the primary division of the hepatic duct in the liver and quite down to the duodenal orifice of the common bile-duct, and, if thought necessary to insure the opening into the duodenum being patent, a long probe is passed into the bowel. The incision into the bile-duct is now closed by an ordinary curved round needle held in the fingers without any needle-holder, a continuous catgut suture being used for the margins of the duct proper and a continuous fine green catgut or spun celluloid thread being employed to close the peritoneal edges of the cut. In such cases, where the pancreas is indurated and swollen from chronic pancreatitis and is likely to exert pressure on the common duct for a time, I insert a drainage-tube directly into the duct and close the opening around it by a purse-string suture, the tube being fixed into the opening by a catgut stitch which will hold for about a week; but where this is not done I usually fix a drainage-tube into the fundus of the gall-bladder in the same way, as this drains away all infected bile and avoids pressure on the newly sutured opening in the duct.

"So easy is it to remove impacted stones after this method of exposure that I now never spend a long time in manipulating stones impacted deeply in the cystic duct, but at once incise the duct, remove the concretions, and close the opening without damaging the duct by much pressure and prolonged manipulation. Although there is seldom any fear of leakage or infection, yet, owing to the separation of extensive adhesions, there is usually some tendency to pouring out of fluid in the first 24 hours. I therefore generally insert a gauze drain through a split drainage-tube, bringing it out either through a stab wound in the loin or forward by the side of the gall-bladder drain. The wound is closed in

the usual way by continuous catgut sutures, first through the peritoneum and deep rectus sheath, next through the anterior rectus sheath, and, lastly, through the skin."

Robson is a strong advocate of the use of calcium chlorid in cholemic cases as a preventive of postoperative hemorrhage. He calls attention to the large mortality from this postoperative complication, and asserts that large doses of the remedy are necessary in order to control the oozing—for several days before the operation 30 grains administered by the mouth, and after the operation 60 grains by the rectum 3 times a day. As a local application to control bleeding in these jaundiced cases there is nothing more efficient than gauze packing together with an application of a solution of suprarenal extract. The greatest care should be taken during the operation and immediately after it to prevent and combat shock. In Robson's 60 cases of choledochotomy the mortality was 16.6 %, but of those operated upon prior to 1900 the mortality rate was 23.8 %, whereas those done since January 1, 1900, show a mortality of only 7.1 %.

J. Ochsner¹ presents a table of 48 cases of **surgery of the gall-bladder and ducts** which he operated upon during 1901, and makes some clinical observations on the subject of the surgery of the gall-bladder. In referring to the fact that Cushing found that 30 % of the gall-stone patients operated upon at the Johns Hopkins Hospital had previously suffered from typhoid fever, Ochsner states that he has found that more than 35 % of his cases had suffered from acute or chronic appendicitis. Ochsner has found that attacks of gall-stone colic which would not subside under the use of as much as $\frac{1}{2}$ to $\frac{3}{4}$ of a grain of morphin hypodermatically would cease as soon as the stomach was irrigated with hot water. In these cases the pain recurred the moment any food was taken into the stomach. This is attributed to the general disturbance of the inflamed parts by the contraction of the stomach. He considers gastric lavage with complete rest to the stomach and rectal feeding of the greatest value. In one of the cases referred to, Ochsner removed from the ileum a gall-stone $1\frac{1}{2}$ inches in diameter which produced an acute intestinal obstruction. It is thought to be a mistake to depend upon biliary colic, jaundice, and the passing of gall-stones for a diagnosis of cholelithiasis. These symptoms of course are of value, but need to be supplemented by others. In only 12 of the 48 cases reported was there severe jaundice at any time; in half of the cases there was no history of biliary colic; and in but a few were gall-stones passed. Symptoms which point to the gall-bladder and ducts are digestive disturbances, such as a feeling of weight or burning in the vicinity of the stomach after eating, and gaseous distention of the abdomen; a dull pain extending to the right from the epigastric region around the right side on a level with the tenth rib and then extending backward under the right shoulder-blade; the point of tenderness upon pressure between the ninth right costal cartilage and the umbilicus; a history of appendicitis or typhoid fever; a very slight jaundice; some increase in the area of liver dulness; and possibly a swelling in the gall-bladder region. Of the 48 cases reported, 6 were fatal, but all of

¹ Ann. of Surg., June, 1902.

these were complicated cases. After discussing the various complications which may be present, Ochsner states as his opinion that it is unwise to operate during an attack of cholecystitis, but that it is better in this condition to bring about relief of the acute symptoms and operate later. In the presence of extreme jaundice if operation cannot be postponed it should be confined to simple drainage of the gall-bladder. In operating for gall-stones it is urged that the appendix should be carefully inspected and removed if found to be abnormal. In operations upon the common duct the author believes in drainage by introducing into the duct a rubber tube and fixing it with catgut sutures. After the operation no food should be given by the mouth for several days; in fact, not until the patient is normal. The drainage-tubes are removed on the fourth day, but the gauze drain is removed earlier if the patient has pain. If the mucous membrane of the gall-bladder is badly inflamed, the drainage-tube is left in for a longer period of time.

A short paper on the **technic of gall-bladder and duct operations** is offered by Mixer.¹ Operations upon the gall-bladder are too seldom performed or are performed too late for the accomplishment of good results. Mixer does not approve of the wearing of rubber gloves in operations on the gall-bladder and ducts, since so much depends upon the sense of touch. In all operations upon the gall-bladder and surrounding structures existing adhesions should be separated and the structures carefully examined, including particularly the pancreas. The best method of examining the ducts is to pass the forefinger of the left hand through the foramen of Winslow, the back of the surgeon being turned toward the patient. By this method the duct, the portal vein, and the artery can be easily felt between the finger and thumb. Since it is impossible to be sure that the contents of the gall-bladder are sterile, it is important before beginning any operative procedure to protect carefully the surrounding peritoneum by gauze packing. The employment of 2 ligatures passed through the gall-bladder wall for the support of the organ is considered much better than the employment of forceps for this purpose, since they do less damage to the part and are less in the way. Drainage is in all cases strongly advocated, as a blood-clot or swelling of the mucous membrane following manipulation may cause obstruction of the duct and distention. Drainage delays matters very little and is a great safeguard. Mixer condemns the plan of suturing the gall-bladder to the abdominal wall, preferring the method which consists in tying a glass tube with a flaring end tightly into the gall-bladder and surrounding both the tube and the end of the gall-bladder with gauze. A rubber tube is then attached to the glass one and all bile may be transmitted through these to a bottle below the bed. One of the advantages of this method is said to be the fact that the gall-bladder is not put upon the stretch, and as a result the patient suffers less dragging pain. The best way in which to remove the gall-bladder is not by the use of the cautery knife or any special instrument, but simply by dividing the peritoneum where it is reflected from the liver to the gall-

¹ Ann. of Surg., Jan., 1902.

bladder and separating the former structure from the latter by means of blunt dissection with the finger. Occasionally the cystic duct is so far from the artery that they may be tied separately. Except when the gall-bladder is firmly embedded in adhesions, Mixter can see no advantage in Mayo's operation of removing the mucous membrane of the gall-bladder over that of total extirpation. The removal of a stone from the common duct may be considered among the most dangerous and difficult of surgical operations. The method of crushing these stones by external pressure upon the duct is not recommended. It has been Mixter's experience that after removing the stones from the common duct by incision the wounds heal as satisfactorily without sutures as with them. In performing cholecystenterostomy the author uses the Murphy button, although he suggests the possibility of employing the elastic ligature. Whenever the abdomen is opened, a careful examination of the gall-bladder should be made and any stones present removed.

C. L. Gibson¹ strongly urges the performance of **cholecystectomy in certain selected cases of gall-stones**. Since gall-stones result from disease of the biliary passages, and particularly of the gall-bladder, and because the mechanical disturbances produced by the impaction of gall-stones in the bile-ducts are almost invariably due to stones which have originated in the gall-bladder, the removal of the gall-bladder would seem to be a measure which would prove absolutely curative. Gibson compares this operation to that of appendicectomy, and refers to the similarity between the affections of the appendix and those of the gall-bladder. It is admitted that thorough drainage is a perfectly satisfactory operation in many cases, but the presence of a biliary fistula for any great length of time is a considerable drawback, and the patient can be given no absolute assurance that gall-stones will not recur after the closure of the fistula. Hans Kehr is quoted as having reported 17 % of remote disturbances in the cases in which he has employed drainage and but 1 % in over 100 cases in which cholecystectomy has been performed. The avoidance of malignant disease, which may result from a continued irritation of the organ, is another advantage in the removal of the gall-bladder, while among the less important advantages Gibson mentions the avoidance of postoperative hemorrhage, which frequently occurs from the mucous membrane. Cholecystectomy should be performed when the cystic duct is obliterated, and also when a stone is lodged in the cystic duct and cannot be dislodged into the gall-bladder, and it is the only satisfactory operative treatment in phlegmonous, ulcerative, or gangrenous conditions. The operation is not recommended as a routine measure in all cases of gall-stones, nor is it thought that it will ever displace simple cholecystotomy. A distended gall-bladder is more easily removed than one of normal size, but when the organ is buried in adhesions and is inaccessible, it is best not to attempt its removal unless there are urgent reasons for the operation. The operation, however, should not be undertaken unless it is quite evident that the common duct and the structures in its neighborhood, particularly the pancreas, are in

¹ N. Y. Med. Jour., Nov. 30, 1901.

functionating condition. In Kehr's cases, which exceeded 100, the mortality was a little over 3 %. Gibson does not attach much importance to the reservoir function of the gall-bladder.

Finney¹ reports 4 cases of **excision of the gall-bladder by a new method** which consists in reflection from the fundus of the gall-bladder of lateral flaps of the peritoneal and muscular coats which are utilized to cover up the raw area left on the under surface of the liver. The division of the peritoneal layer is carried up to the point where the cystic joins the hepatic duct. The stump of the cystic duct after the removal of the gall-bladder is covered by the peritoneum in the manner in which an appendix stump is covered. The advantages of this operation over others are that the gall-bladder is removed unopened, the possibility of infection being thus avoided, and that drainage is unnecessary. The covering of the raw surface of the liver with peritoneum lessens the danger of adhesion at this point. The operation is limited to those cases in which the gall-bladder is distended and its walls thickened. Finney has employed this method in 4 cases; in the first 3 he employed drainage; in the last, however, no drainage was employed and the patient did perfectly well.

James C. Kennedy² reports 2 interesting cases in one of which **disease of the gall-bladder was mistaken for appendicitis** and in the other of which **appendicitis was mistaken for disease of the gall-bladder**. In the first case the patient presented all the symptoms of an acute appendicitis. In the second case there was a previous history of gall-stone colic, there were sudden and severe symptoms, and a tumor was discovered well up in the region of the gall-bladder. In all cases in which there is a doubt as to which of these conditions exists, operate. The incision should be made between the gall-bladder region and the appendix region. The author thinks that when there is a doubt as to the diagnosis between these two ailments, the surgeon is too apt to consider the appendix as the cause.

The indications for the surgical treatment of cholelithiasis are summarized as follows by A. A. Berg³: "(1) Operations of choice—undertaken in the quiescent period, with the object of avoiding serious complications; a simple procedure, and followed by 2 % to 3 % mortality. (a) Severe cholecystitic pain, or oft-repeated uncomplicated attacks of biliary colic, persisting in spite of medicinal treatment. In virtue of which symptoms the patient becomes invalided, and incapacitated for work. (b) After the first attack of acute cholecystitis, associated with fever. (2) Compulsory operations—undertaken at any time of the day or night; often amidst unfavorable surroundings, and in patients who are septic, emaciated, and of low vitality. Difficult and laborious procedures, and attended with high mortality—50 % to 75 %. (a) Foudroyant and intensely acute attacks of cholecystitis. (This may be the first indication of calculous disease, but usually follows previous milder attacks.) (b) Hydrops, empyema, gangrene, or perforation of the gall-bladder, cholemia, abscess of the liver, and diffuse peritonitis."

¹ Johns Hopkins Hosp. Bull., Feb.-Mar., 1902.

² N. Y. Med. Jour., April 5, 1902.

³ Med. Rec., May 3, 1902.

Maurice H. Richardson¹ asks and answers the question, "**Under what circumstances (excepting emergencies) is it desirable to operate upon gall-stones for radical cure or for relief?**" The following reasons are given for the earliest possible operation after the diagnosis of gall-stones is made in the absence of contraindications: (1) Because the operation can be easily and quickly performed and is both safe and effectual. The mortality under these circumstances is extremely small, the danger being less than that of the passage of a single stone from the gall-bladder to the duodenum, and certainly less than the danger constantly present from infection of the gall-bladder through the irritation of the gall-stones themselves. Far too many cases die after late operation because valuable time was lost waiting through many recurring attacks of pain for the diagnosis of gall-stones to be made. Occasionally in operating under the circumstances mentioned the surgeon will find malignant disease of the pancreas, gall-bladder, or some other hopeless condition. However true this may be, such conditions can be dealt with much more readily at an early than a late operation. (2) Because the late complications of gall-stones are either avoided or lessened. The infection of the gall-bladder is a common sequel to gall-stones, as are also dangerous adhesions to surrounding viscera, etc. Another remote effect of gall-stones is malignant disease. (3) If the diagnosis of gall-stones proves an erroneous one, the real condition is discovered and may be removed. This statement is made because occasionally it is impossible to make a correct diagnosis. Frequently pathologic conditions about the pylorus are found, but in such conditions early operation is of great advantage. Richardson refers to a number of cases in which an incorrect diagnosis of gall-stones was made, but in which he was able to relieve the real condition at the time of operation. (4) Late operations upon gall-stones are both difficult and dangerous, as all experienced surgeons in this line of work well know. The common source of danger in these cases is jaundice, which predisposes so strongly to hemorrhage. It is in these late operations that cholecystectomy is so often indicated. The following paragraph from Richardson's paper illustrates this point: "I recall the remark of a physician who had allowed a patient to drift through months of hopeless jaundice,—with all that that condition implies,—for the relief of which a delayed operation proved fatal from hemorrhage: 'I shall never forgive myself for allowing this operation.' Those of us who heard the remark thought it would have been more appropriate if he had said: 'I shall never forgive myself for not having advised this operation earlier.' " These following arguments may be used against early operation: (1) Although the danger is slight, still there is some danger in the operation. (2) The diagnosis may be wrong and the exploration may be found to have been unnecessary. (3) Hernia in the scar may result. These objections are answered by the foregoing remarks. (4) There is the possibility of the recurrence of the gall-stones. Richardson states that he has never had reason to suspect the recurrence of gall-stones after cholecystotomy and drainage. (5) There is a possibility of a spontaneous cure.

¹ Boston M. and S. Jour., Sept. 5, 1901.

Spontaneous cures, however, are infrequent and are often accompanied by grave dangers. (6) Although symptoms may be present which warrant a diagnosis of gall-stones, these stones may give rise to no subsequent trouble. Richardson does not deny this, but states that, since it is impossible to tell what the future will bring forth, this argument is of little weight. (7) The last and decisive attack of biliary colic may have resulted in the expulsion of the only remaining stone. Such an occurrence is possible, but it does not protect against future formation of stones, as drainage of the gall-bladder is so likely to do.

C. D. Mosher¹ presents a most interesting and complete discussion of the **frequency of gall-stones in America** as compared with other countries. The conclusions reached are as follows:

"Nationality: On the basis of the analysis of the 1655 autopsies from the Johns Hopkins Pathological Department, as compared with 1150 (?) cases as given by Schröder, of Strassburg, gall-stones are less frequent in the United States than in Germany, the United States showing a frequency of 6.49 %, Germany of 12 %.

"Age: The frequency of gall-stones in a given number of cases will increase with the age of the patients examined. The American cases tend to confirm the statements of previous observers that gall-stones are rare before the thirtieth year and more frequent after that age.

"Color: Gall-stones are more frequent in the white than in the black race, the American cases showing a frequency of 7.85 % in the whites and 5.51 % in the negro.

"Sex: Women are more liable to have gall-stones than are men, the American cases showing the frequency in 618 women to be 9.37 %, and in 1037 men to be 5.94 %. The American women have gall-stones only about half as frequently as the German women. In the United States only about 1 woman in every 10 has biliary calculi, while in Germany, according to Naunyn, gall-stones are found in 20.6 %, or in about one woman in every 5."

The **surgical treatment of biliary calculi**, with special reference to **hepatotomy**, was discussed in the presidential address of W. E. B. Davis² at the Fourteenth Annual Meeting of the American Association of Obstetricians and Gynecologists. Davis suggests that when gall-stones are found during pelvic operations they should be removed after the pelvic wound has been closed, and not through it, as recently suggested by Kelly. Cholecystectomy is indicated in "gangrene of the gall-bladder, multiple or perforating ulcers, stricture of the cystic duct, phlegmonous cholecystitis, empyema with great danger to the walls of the viscus, and malignant disease." In chronic cholecystitis the operation is not recommended, as it is thought that drainage is better. The writer refers briefly to the history of the various operations upon the gall-bladder and its ducts. When a stone is present in the common duct and cannot be pressed up into the gall-bladder or down into the duodenum, it should be removed through an incision into the duct, which should not be closed

¹ Johns Hopkins Hosp. Bull., Aug., 1901.

² Jour. Am. Med. Assoc., Dec. 14, 1901.

with sutures but should be allowed to drain. Davis quotes Kehr as supporting drainage in these cases in preference to closing the suture. The latter's unusual success in the treatment of these cases (6 deaths in 97 choledochotomies) is thought to be due to his having drained in extreme exhaustion and cholemia and when marked cholangitis was present. Davis refers to the operation of hepatotomy, which he has suggested in cases of obstruction of the ducts with enlarged liver where the gall-bladder or ducts cannot be isolated or the patient's condition from exhaustion or cholemia will not permit of a protracted operation. The operation is only exceptionally called for, but Davis relates a number of cases in which he has freely incised the liver, where the ducts have been obstructed, with the most satisfactory improvement in the patient's condition. When this drainage of the liver has resulted in its contraction and improvement in the patient's condition, an exploration of the gall-bladder and its ducts can be made.

The **surgery of cholecystitis** is dealt with by J. Chalmers DaCosta,¹ who, after referring briefly to the cause of this condition, discusses its diagnosis and treatment. The symptoms of catarrhal cholecystitis unassociated with jaundice frequently results in a diagnosis of cholelithiasis. The similarity of symptoms is caused by the passage of semisolid plugs of mucus through the biliary passages. In this condition the gall-bladder is usually distinctly distended. Jaundice does not often appear in catarrhal cholecystitis when gall-stones are not present; when it does occur, it is trivial and transitory. The attacks of pain due to the passage of plugs of mucus are much less severe and less prolonged than those due to the passage of a gall-stone. Tenderness, which is present in cholelithiasis, is usually absent in uncomplicated catarrhal cholecystitis. Although the majority of cases of catarrhal cholecystitis are curable by medicinal means, yet in a large minority this method of treatment fails. In such a case, whether gall-stones be present or not, operation is indicated, and should consist in drainage of the gall-bladder for a week or more. This treatment almost invariably produces a cure. Membranous inflammation of the gall-bladder and bile-ducts is extremely rare, yet cases have been reported. The passage of the membranous material results in biliary obstruction and symptoms which are practically identical with those of gall-stones. The condition is usually associated with membranous enteritis, and the diagnosis may be made by discovering membranous intestinal casts in the stools. When medicinal measures fail to relieve this condition, drainage of the gall-bladder is indicated. When virulent microorganisms are introduced into the gall-bladder, or when the tissues present a low resistance, catarrhal cholecystitis may pass into empyema of the gall-bladder, acute phlegmonous cholecystitis, infective cholangitis, suppurative cholangitis, or ulceration of the gall-bladder. As a result of these conditions perforations into the peritoneal cavity, into the gastrointestinal canal, or into the retroperitoneal tissues, or elsewhere, may take place. These changes may also produce hepatic abscess, pericystic abscess, dense adhesions, the extensive destruction of

¹ Medicine, May, 1902.

mucous membrane, etc. A simple empyema of the gall-bladder is a rare condition unless gall-stones are present or unless typhoid fever exists or has existed. Aside from the history of gall-stones which most of these cases present, there is a persistent pain and a definite swelling in the gall-bladder region. This swelling is tender on pressure. The constitutional symptoms may be very light or very severe, but rarely is there a distinct jaundice. It is often necessary to differentiate this condition from a floating kidney. The history and a careful consideration of the symptoms of these two conditions will usually enable the surgeon to differentiate them. Early drainage in simple empyema usually results in a cure. In operating for this condition a careful search should be made for any obstruction of the cystic duct, and this must be removed. The operation may be complicated by the presence of a pericystic abscess or by gangrene of a portion of the gall-bladder. Occasionally a recurring simple empyema of the gall-bladder is met. Acute phlegmonous cholecystitis is usually associated with the presence of calculi; though it may arise when no stones are present. In these cases death from a rapid peritonitis may result even without perforation of the gall-bladder walls. The pathology corresponds to that seen in a like condition of the appendix. The disease is sudden in onset, the symptoms presented being violent pain in the gall-bladder region which radiates to the right shoulder and which quickly becomes general throughout the abdomen, tenderness and great rigidity, thoracic respiration, exhausting vomiting, and a septic fever. Jaundice is present sometimes, but in many cases is absent. It is this form of cholecystitis that is frequently mistaken for appendicitis, and a diagnosis between the two conditions is sometimes impossible. The situation of the primary pain is of importance in the diagnosis, and likewise the situation of the tenderness, but either of the organs may be abnormally situated and a mistake in diagnosis will then be likely to occur. It should be borne in mind that in acute phlegmonous cholecystitis there is absolute constipation, otherwise the condition may be mistaken for one of mechanical obstruction of the bowels. In any case in which there is doubt regarding the cause of the symptoms, immediate operation should be performed. When operating for acute phlegmonous cholecystitis, it is as important to extirpate the organ as it is to extirpate a gangrenous appendix. When this cannot be accomplished the gall-bladder should be surrounded with iodoform gauze and a drainage-tube introduced down to the cystic duct. When the question comes up of performing an operation upon the gall-bladder in one or two stages DaCosta prefers the one-stage operation in most instances.

Acute cholecystitis and cholangitis as a complication of gall-stones is discussed by Eisendrath,¹ who reports a case of a girl aged 17 who was operated upon for gall-stones and purulent cholecystitis. Colon bacilli were found in the gall-bladder. The patient died 3 days after operation with symptoms of cholemia. The death is attributed to diffuse hepatitis and nonsuppurative cholangitis, evidences of which conditions were revealed on examination of the liver. The author condemns any

¹ Jour. Am. Med. Assoc., Nov. 30, 1901.

nonsurgical treatment after empyema of the gall-bladder has been diagnosed. He reviews very thoroughly the literature regarding the etiology and pathology of infection of the gall-bladder and bile-ducts, and discusses the symptoms of the various forms of cholecystitis.

E. D. Ferguson¹ reports 3 cases in which there was a **malposition of the gall-bladder**. The first patient was a man 45 years of age in whom a diagnosis of gall-stones was made. The usual digital examination was made for the gall-bladder, but without result, although no adhesions were present. By greatly extending the incision Ferguson was able to feel the gall-bladder after locating the duct and tracing it backward and upward to the posterior border of the liver. The organ was situated behind the peritoneum in the position indicated. It was only recognizable from the fact that it contained gall-stones. It seemed to extend from the vena cava upward and backward. It was impossible to see the viscus, and because of its proximity to the vena cava Ferguson hesitated to incise it. The position of the organ was verified, however, by the introduction of an aspirating needle, through which flowed a small amount of bile. Drainage was introduced and the abdomen closed. A small amount of bile escaped on the dressings for about a week. The patient was operated upon on April 18, 1900, and since then has suffered from no symptoms. The second patient was a man 75 years of age. In this case the gall-bladder was located at the posterior edge of the under-surface of the liver behind the peritoneum and lying in a transverse direction. It was contracted and contained a number of gall-stones. It was impossible to bring the gall-bladder to the abdominal wall. A number of stones were removed and drainage was established. The patient made a satisfactory recovery. In the third case Ferguson was obliged to operate in spite of the existence of deep jaundice. The patient was a man 48 years of age. In this case the gall-bladder was greatly distended and was attached to the under surface of the liver and at the posterior border and extended downward to the right of the spine and behind the colon. In order to expose it, the operator drew the hepatic flexure of the colon well down and to the left. Drainage was established. On the tenth day after operation the patient suffered from a profuse hemorrhage which continued for more than a week. Firm packing was employed and suprarenal extract was used locally and internally. At the time of the report Ferguson states that the icterus has nearly disappeared and that the patient's general condition has greatly improved.

Enderlin and Justi² have performed a number of experiments to ascertain the value of Robson's suggestion of **employing omental grafts in repairing wounds of the gall-bladder**. The results obtained were most satisfactory. On the inner surface of the transplanted omentum epithelium soon develops. The authors believe, however, that resort to this method of repair is seldom necessary, since small wounds heal well after simple suture, and drainage should be used if a wound is large. When the gall-bladder has been badly lacerated,—for instance, after the extraction of a large calculus,—its removal is to be preferred to an attempt at repair.

¹ Amer. Med., Dec. 21, 1901.

² Deut. Zeit. f. Chir., Oct., 1901.

John F. Thompson¹ reports an interesting case of a man who was thrown from a cart, which accident resulted in the **extravasation of a large amount of bile into the peritoneal cavity**. Thompson did not see the patient until about a month after the injury. Eleven days after the injury the patient's physician had removed by aspiration 5 quarts of apparently pure bile. In the subsequent 3 weeks the patient was aspirated 7 or 8 times, and each time several quarts of bile was removed. When seen by Thompson, the patient was much emaciated, the urine was laden with bile, and there was some jaundice and severe abdominal pain. The abdomen was considerably distended, was dull on percussion, and vomiting was occasionally taking place. The patient's temperature at this time was 101.5° F., and the pulse was 130. The abdomen was immediately opened and about 4 quarts of bile was evacuated. Extensive adhesions were found everywhere in the abdominal cavity, so that the exact point of rupture of the biliary tract could not be ascertained. Drainage was established and the patient gradually recovered.

A case similar to the above is reported by De Forest Willard.² The patient was a boy 5 years of age who was run over by a wagon. Willard first saw him 3 months after the injury. When first seen, the patient had just completed a journey of 2000 miles. At this time there was extreme exhaustion, intense pain in the abdomen and back, marked bulging and extreme tenderness in the entire abdominal zone front and back, and absolute rigidity in the lumbar and lower dorsal regions with decided kyphosis, the spinous processes projecting not angularly but in a long curve. A careful examination of the abdomen revealed an elastic fluctuating mass occupying the entire lower segment as high as the umbilicus and the entire right side as high as the epigastrium. The left hypochondriac region was the only area which was resonant. An exploratory incision was made in the right iliac region. When the peritoneum was opened, a thin greenish-yellow fluid gushed forth. Of this fluid, which proved to be nearly pure bile, 64 ounces were removed. There was no pus and no blood. As the patient was in an extremely low condition no attempt was made to discover the point from which the bile came, and the abdominal wound was closed without drainage. Great improvement immediately followed the operation, but the fluid slowly reaccumulated, and 2 weeks later 32 ounces were withdrawn by aspiration. The patient was kept in bed with head extension and dorsal rest in order to control the traumatic spondylitis. Four weeks after the operation the wound was partly reopened, a small amount of bile was evacuated, and a rubber drainage-tube was introduced. The flow of bile slowly diminished, and ceased entirely 2½ months after the operation. A spinal support was adjusted 3 months after the operation and the child entirely recovered.

W. P. Manton³ reports a case of **primary cancer of the gall-bladder with secondary invasion of the liver, duodenum, and surrounding structures**. The patient suffered for a long time from gastric disturbances. At the time of operation a number of large stones were removed

¹ Boston M. and S. Jour., Aug. 15, 1901. ² N. Y. Med. Jour., Mar. 1, 1902.

³ Amer. Med., Oct. 5, 1901.

which had evidently been present for many years. A second case reported is that of cancer of the common bile-duct with probable secondary invasion of the gall-bladder. The symptoms in this case resembled those of gall-stones. The patient died the third day after cholecystotomy was performed. Manton reaches the following conclusions: "Although primary cancer of the gall-bladder and bile-ducts is rare, recent investigations go to show that it is not so uncommon as generally supposed. As a rule, the onset of the condition is insidious; there are no symptoms developed at an early stage of the disease in either locality, with which we are at present acquainted, which will permit of a positive diagnosis being made. When this is possible, the disease has already advanced beyond the helpful intervention of surgery. Fever, having been observed in so many other conditions of the liver and adjacent organs, is of little or no value as an aid to diagnosis. The same may be said of blood examination. Emaciation is frequently absent, and the patient may remain in apparently good health until toward the termination of the disease. The absence of malignant disease elsewhere has no diagnostic significance. The only symptom which may perhaps prove of service in forming a provisional diagnosis of gall-bladder and bile-duct malignancy seems to be of gastric origin. In two of the cases above reported, and in many cases found recorded in the literature of the subject, disorder of the stomach preceded the local symptoms of cancer. Further investigation along this line is desirable, and all protracted disorders of the stomach which cannot be positively referred to other causes should be viewed with suspicion as a possible indication of beginning malignancy of the gall-bladder or bile-ducts."

McGavin¹ reports an interesting case of **hydatid cyst of the gall-bladder**. The author has been able to find but three other cases recorded in the literature of the past 20 years. A physical examination of the patient, who complained of pain over the epigastrium and suffered from attacks of vomiting, resulted in a diagnosis of growth of the omentum. Exploratory laparotomy revealed the true condition and a cholecystectomy was performed. The patient made a good recovery.

Roswell Park² discusses at some length the **surgical treatment of injuries and diseases of the pancreas**. Experience has not yet shown that complete removal of the pancreas would be either justifiable or successful in man. Dogs have been known to live after the removal of this organ. Patients, however, have stood the removal of large portions of the pancreas. In traumatism of the pancreas bleeding should be controlled, the escape of pancreatic juice prevented, and the cavity disinfected. Cases have been reported of gunshot wounds of the pancreas in which the patient lived from 12 to 35 days after the injury, and then died rather from complications than from injury of the pancreas. Exploration of the pancreas is difficult, particularly if the patient is stout. If there is no sign of posterior perforation of the stomach, injury of the pancreas by a foreign body is unlikely. The generally accepted route in approaching the pancreas is through the gastrocolic omentum. If pos-

¹ Lancet, Feb. 22, 1902.

² Amer. Med., Dec. 15, 1901.

terior drainage is established, the anterior wound may be closed. Prolapse of the pancreas has been noted in a few cases. There are 8 cases on record where an actual prolapse of at least a portion of the pancreas has taken place.

For malignant disease of the head of the pancreas there is probably no radical treatment, but when there is a localized abscess or tumor of the splenic portion its excision is justifiable, as successful cases have been reported. The danger accompanying the removal of a large portion of the pancreas is injury of the splenic artery. Pancreatic cysts may be partially excised and drained. Complete excision has been successfully practised in a few cases. In operating for pancreatic cysts it is proper to endeavor to discover any obstruction of the pancreatic duct which may be present, since cysts may result from impacted calculi. Pancreatic calculus is difficult of diagnosis, but when discovered it should certainly be removed, either by direct incision or possibly through the duodenum.

Park approves of Robson's classification of acute pancreatitis, speaking of "acute pancreatitis with or without fat necrosis, with or without hemorrhage, with or without pus, and with or without gangrene." In all cases where symptoms of acute pancreatitis are present exploratory abdominal section is indicated, if the disease is to be arrested. When it is possible, Robson's suggestion of preceding operation with the free use of calcium chlorid is approved; this is given with a view to checking the tendency to postoperative bleeding. Robson suggests that there is less danger of serious hemorrhage in patients jaundiced from gall-stones than when the jaundice depends upon pancreatic disease. There is undoubtedly some mysterious connection between pancreatic disease and hemorrhage. The treatment of acute pancreatitis is practically that of peritonitis of the upper abdominal cavity, and consists largely in drainage. Early operation in this condition is just as wise as in fulminating appendicitis. Posterior drainage is preferable to anterior. In such a case the abdomen should be opened between the sternum and umbilicus, and the pancreas exposed either above or below the stomach. Pus should be removed and drainage controlled by packing. Any necrotic portion of the pancreas should be removed. Posterior drainage should then be established and the anterior wound closed or not as seems to be indicated.

The treatment of subacute pancreatitis consists for the most part in exposure and drainage of a localized abscess. Chronic pancreatitis usually arises from disease of the biliary passages, the pancreas being involved secondarily. In this condition cholecystenterostomy may be performed or drainage of the gall-bladder externally. Park refers to 2 cases in which an opening established between the gall-bladder and the bowel has been found completely closed a few months after operation. Chronic interstitial enlargement of the pancreas may closely simulate malignant disease, but this should not deter the surgeon from operating. Primary tuberculosis of the pancreas must be very rare, most cases being due to extension of the disease from neighboring organs. In pancreatic disease so much harm comes from delay, and so much good may be done by prompt action, that Park urges the surgeon when in doubt to operate.

Francis W. Murray¹ reports 3 interesting cases of **pancreatic disease**. The first case is one of suppurative pancreatitis occurring in a man 41 years of age. It is thought that this condition was brought about primarily by a slight trauma of the pancreas, the result of a strain, and secondarily by the ingestion of a large amount of alcohol 10 days later. The case when admitted was thought to be either a pancreatic cyst or an echinococcus cyst of the liver. The former condition was suspected because of the history of traumatism and because of the rapid growth of the mass. At the operation the cyst was evacuated through a cannula and then a 3-inch incision made in its anterior wall. The cavity was packed with iodoform gauze and a small gauze drain introduced into the peritoneal cavity. Pathologic examination of the fluid removed showed it to be made up of pus, lumps of fat, and pancreatic juice. About 3 weeks after the operation the patient developed symptoms which pointed toward an abscess of the liver, which organ was considerably enlarged downward. When the abdomen was opened, a hard fibrous cord was found passing from the former abdominal wound to the head of the pancreas. Several small liver abscesses were evacuated and packed. About 3 weeks after this operation the patient was seized with a violent cough and expectorated large amounts of sputum containing pus, bile, and liver-cells. Cough and emaciation continued, but the patient left the hospital, and all efforts to locate him proved futile. The suppuration in the liver is thought to have been due to infection through the common bile-duct and is not believed to have resulted from the original operation, as the healing of the abscess-cavity was steady and rapid. A second case reported is one of **gangrenous pancreatitis** occurring in a man 57 years of age. This case began as one of acute hemorrhagic pancreatitis, which, not terminating fatally, in a few days assumed the gangrenous form. The condition developed on shipboard, but it was thought that the patient was suffering from bowel obstruction. The patient was brought to the hospital and the pancreas was thought of as the seat of the trouble, because there was local tenderness and slight abdominal rigidity above and to the right of the umbilicus, and because the urine, which prior to his illness had been free from sugar, now contained 2 % of sugar. Soon after admission Murray was in favor of an exploratory incision, but his consultants did not concur and no operation was done. At the autopsy a diagnosis of gangrenous pancreatitis was easily made. The third case is an interesting one of pancreatic cyst occurring in a young woman 19 years old. Drainage was established and the patient made a good recovery with a slight fistula.

An interesting case of **traumatic pancreatic cyst** successfully operated upon by Mr. Syme is reported by H. W. Stevens.² The patient was a woman 27 years of age who entered the hospital because of swelling of the abdomen. Ten weeks before admission she was knocked down by a cab, after which she suffered from a general swelling and hardness of the abdomen without pain or obstruction of the bowels. Fourteen days

¹ Amer. Med., Jan. 25, 1902.

² Intercol. Med. Jour. of Australasia, Oct. 20, 1901.

before admission she first noticed a tumor of the upper abdomen to the right of the mid-line. This tumor continued to enlarge, causing considerable bulging of the parietes. No pain was felt in the recumbent position and only a dragging sensation when the patient was erect. Although always delicate, the patient said she was perfectly well before the accident. Examination showed considerable fulness of the abdomen with marked lateral bulging of the lower ribs on the right side and to some extent on the left side. A well-marked tumor was noticeable in the epigastrium to the left of the mid-line. This tumor was found to occupy the whole upper portion of the abdomen, was tense, and fluctuated. The dulness over the tumor was continuous with the liver dulness and extended as high as the fourth interspace. The apex-beat of the heart was felt at the fourth interspace. The lower portion of the tumor presented a well-defined contour extending downward and outward to within an inch of the right iliac crest and to within $1\frac{1}{2}$ inches of the left iliac crest. Under chloroform anesthesia a 3-inch incision was made above the umbilicus. When the peritoneum was opened, dense adhesions were met which obscured the anatomic characteristics of the abdominal structures. The position, however, of the stomach on the left and the liver on the right with the cyst-wall in the center was definitely made out. By means of an aspirator, 132 ounces of fluid were withdrawn from the cyst. The cyst was then incised and the finger was introduced. Examination of the cyst suggested the pancreas as its possible origin. The cyst was attached to the abdominal wound and drainage instituted. The fluid escaping subsequently possessed the quality of converting starch into sugar. Ten days after the operation fatty food was given and the stools were examined for fat, with a negative result. The patient made a satisfactory convalescence and was discharged from the hospital 30 days after the operation. The circumference of the abdomen had diminished from 29 to 23 inches. Six weeks after the operation there was still a slight purulent discharge from the wound.

A case of **acute pancreatitis with fat necrosis**, in which a successful operation was performed, is reported by Wm. J. Mayo.¹ The patient was a man 59 years of age who was admitted to the hospital on June 11, 1901, in very good condition. On June 4th the patient was suddenly seized with severe pain in the epigastrium accompanied by vomiting and symptoms of collapse. Distention of the abdomen and other symptoms of obstruction of the bowels developed. As a result of medication and enemas some slight movement of the bowels was obtained. Two days after the onset of symptoms gastric lavage modified the acuteness of the symptoms and the patient was nourished per rectum. The general symptoms, however, remained unchanged when the patient was admitted. A small amount of albumin was present in the urine at the time of admission; the abdomen was very tympanitic; an irregular and indefinite mass about the size of a fist could be felt to the right of and above the umbilicus. The temperature was 101° to 102° F., pulse 120 and of poor quality. The patient was restless and hiccupped at intervals; a slight jaundice was

¹ Jour. Am. Med. Assoc., Jan. 11, 1902.

present. A diagnosis of gangrenous cholecystitis was made and operation immediately performed. When the abdomen was opened, the omentum was found thickened, adherent, and infiltrated with little white or brownish spots varying in size from that of a hempseed to that of a pea, or larger. When the omentum was separated, some bloody fluid escaped from the peritoneal cavity. The mesentery also contained the same small bodies found in the omentum. When the omentum and transverse colon were lifted up, the pancreas was found very much enlarged, and felt like a "pudding in a tight sack." The introduction of the aspirating needle into various parts of this mass resulted in the withdrawal of only small amounts of bloody fluid. With some difficulty the gall-bladder was exposed and found to be greatly thickened and to contain a stone about the size of a small hen's egg. When it was incised, a small amount of mucopurulent material escaped. The stone was removed and the gall-bladder drained through a separate opening. The patient was very much shocked after the operation, becoming delirious. Atropin was found most efficacious for this form of shock. Eighteen hours after the operation an enormous amount of bloody serum escaped through the tube. This discharge was found to contain pancreatic fluid and bile. So great was the discharge that the dressings required changing every 4 hours for a time. The patient slowly regained health and made a satisfactory recovery. The case is summarized as one of gall-stone producing a cholangitis which extended to the pancreatic ducts and producing an acute pancreatitis and fat necrosis. Free drainage of the gall-bladder, which relieved the tension of the pancreas, checked the process short of abscess-formation.

Joseph Ransohoff¹ discusses the question of **cystadenoma of the pancreas** and reports a case in which he performed a nearly complete extirpation of a cystadenoma. The cyst was separated from the adjacent viscera after 3 quarts of chocolate-colored grumous material had been removed. It was then withdrawn through an incision in the gastrocolic omentum and all but a small portion removed; this remaining portion was fixed in the abdominal wound and its lining membrane destroyed by the thermocautery. Removal of the entire cyst-wall would have destroyed the splenic vein. After the operation the patient suffered from severe vomiting, which lasted nearly 48 hours. In 3 weeks the stump had been entirely covered by cicatricial tissue.

A case of **pancreatic cyst** occurring in a boy aged 16 is reported by Jaboulay.² The first symptoms complained of were violent attacks of pain in the abdomen accompanied by vomiting; jaundice was also noted at this time. The symptoms gradually disappeared, but 4 months later the patient complained of a fixed pain in the epigastrium and left hypochondrium, unaccompanied by colic or vomiting. At this time a tumor was discovered at the site indicated which the patient declared had only existed for a week. The abdomen was opened and a large cyst, containing 5 pints of reddish-brown fluid, was tapped. The cyst-wall was incised and a hand introduced came in contact with the bodies of the upper lumbar vertebrae, and the cyst was found to arise from the body of the pan-

¹ Amer. Med., July 27, 1901.

² Lyon Méd., Feb. 16, 1902.

creas. Drainage was established. The fluid removed responded to all the tests of pancreatic juice. The patient recovered with a small fistulous tract.

A case of **partial excision of the pancreas for a multilocular cystic tumor** is reported by Heaton.¹ The patient was a woman aged 27 who presented an enormous left-sided abdominal tumor which contained fluid. The condition was thought to be one of hydronephrosis, but an incision in the loin exposed a normal kidney. The abdomen was then opened and the tumor found to be a large multilocular cyst arising from the pancreas. Although some cystic change was present in the head of the pancreas it was determined in removing the cyst to leave this portion of the organ. Before the tumor was removed a trocar was introduced into it and about 1½ pints of fluid withdrawn. This fluid was found after the operation to be the contents of one cyst, the tumor being made up of a number of smaller ones. Heaton looks upon the case as one of congenital cystic disease of the pancreas. This view is strengthened by the fact that the fluid contents of the cysts had no digestive properties. The patient's digestive powers prior to operation and after it were good. The urine was repeatedly examined for sugar, but no trace was found.

M. S. Kakels² presents a study of **primary sarcoma of the tail of the pancreas**, reporting in detail a case occurring in a woman 41 years of age. The author concludes that "the difficulties in the diagnosis of malignant pancreatic tumors are so numerous and great that we rarely find a case in literature in which a correct diagnosis has been made before operation or necropsy. Recognition in the living of the nature of the growth is almost impossible. Tumors of the pancreas are of the greatest interest to surgeons, as it has been only of recent years that operations have been made for their removal. For surgical intervention the most important symptom is a palpable tumor. Cysts have been incised and their contents evacuated. Less frequently, however, have solid growths offered opportunities for surgical interference. Removal of solid tumors with a portion of the gland itself is exceedingly dangerous and rarely successful. Even if it were possible to extirpate the gland, aside from the insurmountable difficulties on account of the blood-vessels and close proximity of the neighboring organs, the surgeon would not be justified, because, as Minkowski has shown, the entire removal of the gland is followed by rapid and fatal diabetes."

John D. Malcolm³ reports an interesting case of **sarcoma of the tail of the pancreas occurring in a child** 4 years and 8 months of age. At first the growth was diagnosed a tumor of the left kidney. Under treatment the general condition of the patient, who was extremely emaciated and anemic, greatly improved. The tumor, however, increased in size, extending to the left loin, pushing the lower ribs upward and forward, and bulging the side outward. It also extended across the abdomen as far as the outer edge of the right rectus and downward to below the level of the anterior superior iliac spines. Palpation showed the

¹ Brit. Med. Jour., Oct. 19, 1901.

² Amer. Jour. Med. Sci., Mar., 1902.

³ Lancet, Mar. 1, 1902.

tumor to be smooth and elastic. It was also slightly movable. The veins over the upper part of the abdomen were distended. The abdomen was opened through the upper part of the left linea semilunaris; the retro-peritoneal space was opened above the transverse colon, and when this was done, little difficulty was encountered in separating the tumor from the surrounding connective tissue. The lower end of the spleen, however, was firmly adherent, and when the growth was drawn from the abdomen it was found to be attached to the tail of the pancreas. A portion of the pancreas was ligated and removed with the growth; to the inner side of the seat of the original growth was felt a mass of new growth, which was not, however, removed on account of the patient's serious condition. The patient did not survive the shock of the operation. It was found at the necropsy that the kidneys were healthy and normal. Caseating glands were discovered near the bifurcation of the trachea and in the anterior mediastinum. The secondary growth discovered at the time of operation was situated in the gastrohepatic omentum, and, when examined, proved to be, as did the tumor, a fibrosarcoma. The article is accompanied by illustrations.

Harris and Herzog² discuss the question of **splenectomy in splenic anemia or splenomegaly**, reporting 2 cases. The first case recorded is that of an unmarried woman 22 years of age. The duration of the condition in this case was 9 years. Operation was performed May 25, 1899. Besides its long duration, the points of interest in this case are the marked brownish pigmentation, which gradually disappeared after the removal of the spleen; the high temperature, lasting for 2 weeks after the operation without known cause; the remarkable increase in both red and white blood-cells immediately after the operation, the increase in the reds being followed by a fall, and this in turn by a gradual increase in number; a peculiar attack of sickness, occurring 6 months after operation, in which there was a great reduction in the number of red cells; the return of the red cells to a good number, which has been maintained for more than a year; the return of the leukocytes to a normal number, but with a marked change in the relative percentage of the different varieties; and the suspension of menstruation. The second case is that of a man 47 years of age. He presented a marked enlargement of the spleen without leukemia. There was no malaria or other condition to which enlargement of the spleen could be attributed; a moderate degree of anemia with diminished color-index was present, and the patient showed progressive loss of strength and flesh. Splenectomy was performed September 28, 1900. For 10 days after the operation the patient's temperature ranged between 99° and 101° F., there being no local condition to account for it. Since his operation the patient has been able to attend to his business. The duration of this case prior to operation was only a few months, a marked leukocytosis being one of the prominent symptoms. This is contrasted with the first case, which extended over several years and presented marked leukopenia. The characteristic features of primary splenomegaly are, considerable enlargement of the spleen; a moderate anemia

² Chicago Med. Recorder, Mar. 15, 1902.

accompanied by a lower color-index; an absence of the blood-changes peculiar to leukemia; loss of strength and flesh; a progressive tendency toward a fatal termination. Sippy's view that the disease terminates fatally in from 5 to 6 months is shown to be erroneous by Oser's report of several cases in which the condition existed from 5 to 12 years, and by the first case the authors report. A minute description of the spleen in each of these cases is presented. The chief histologic change found was endothelial proliferation. The authors look upon the splenomegaly as a process similar to lymphangioma. The ischemic infarcts so frequently seen in splenomegaly probably owe their origin to cell thrombi formed by numerous leukocytic elements found in the enlarged lymph blood-spaces. The authors have in vain searched the sections of the two spleens removed for phagocytic cells containing red blood-corpuscles, and state that the literature on splenomegaly contains no statement that such are present. One case recorded in which such phagocytic cells were found was complicated by typhoid fever, and therefore proves nothing. One fact appears certain—namely, that the changes in the spleen must in some way be responsible for the blood deterioration in splenomegaly; if this were not the case, the removal of the changed spleen would not produce the excellent results it does. The treatment of this condition from a medical point of view has proved unsuccessful. Sippy has collected 17 cases of splenectomy for primary splenomegaly, and to these the authors add their two cases, making, in all, 19 cases with 14 recoveries, 4 deaths, and 1 case in which the result is not stated. Unfortunately, little data has been presented regarding the after-history of the cases which recovered. The first case reported by the authors has been under observation 22 months since operation. In one case of those reported by Sippy the patient had been observed for 33 months after operation. If it can be shown that these patients did not simply recover from the operation, but fully regained their strength and health, it will establish the operation as the proper treatment for the condition; and if it becomes the established treatment, this operation is advisable as soon as a correct diagnosis can be made, since the longer it is delayed, the greater the dangers of the operation become.

Février¹ presents a statistical study of the **surgery of the spleen**. Among the cases of injury are 56 ruptures of the spleen, in 46 of which the spleen was removed, with a mortality of 50 %. Of traumatic hernia of the spleen 30 cases are recorded, all of which were treated successfully by splenectomy. The author recommends splenectomy in the treatment of hydatid cysts of the spleen, except where there are many firm adhesions, when incision and drainage are indicated. He has collected 42 cases of splenectomy for leukocythemic spleen, in which there were only 4 recoveries, and the nature of two of these is said to be doubted. The cause of death in these cases was hemorrhage. Of splenectomy for malarial spleen 86 cases have been operated upon within the last 10 years, with a mortality of 17.4 %. It is advised that the operation should be undertaken only in favorable cases, and should be avoided when dense

¹ Rev. de Chir., Nov., 1901.

adhesions are present. The operation is not done in order to cure the malaria, since periodic attacks of fever may occur after the removal of the spleen. Février has collected 16 cases of splenectomy for idiopathic enlargement of the spleen; that is, enlargement not due to leukocythemia or malaria. In this series there were but 3 deaths. Fixation of the spleen for simple movability has not been done often enough to allow the formation of definite conclusions regarding the operation; the results obtained, however, have been encouraging. Thirteen cases of splenectomy done for enlarged movable spleen with or without torsion of the pedicle have been recorded, with 3 deaths.

Tédenat¹ presents an interesting article upon **abscess of the spleen**. The author deals with the literature of the subject and adds an instructive case of his own. The patient was a woman 24 years old and the condition arose 4 months after an attack of mild typhoid, a firm swelling presenting in the left hypochondrium and extending a little below the umbilicus. But vague signs of fluctuation could be elicited. The patient had a low fever and a rapid pulse. An incision along the external border of the left rectus exposed the peritoneum, free from any evidences of inflammation, and a very much enlarged spleen, which was not adherent. The spleen was sutured to the abdominal wound and the abscess opened by the introduction of a bistoury. Pus was not obtained, however, until the knife had been introduced to a depth of about 2 inches. Two and a half pints of pus containing fragments of splenic tissue and blood-clot were withdrawn. Eberth's bacillus was found in great quantities in the pus. At the end of 2 months the drainage-tubes were removed and a fistula remained for 4 months. A year after the operation the patient presented a healthy depressed cicatrix, but also showed signs of pulmonary phthisis. At this time it was impossible to palpate the spleen.

DISEASES OF THE RESPIRATORY ORGANS.

Rudolph Matas² considers at some length the various plans of producing **artificial respiration** and describes a new method for accomplishing this by direct intralaryngeal intubation with a modified O'Dwyer apparatus and a graduated air-pump. The apparatus may be used in maintaining prolonged artificial respiration in ether and chloroform asphyxia, in acute cocain-poisoning and opium narcosis, in drowning, etc. The accompanying illustrations (Figs. 27 and 28) show the apparatus. Regarding this instrument Matas says: "(1) It is a graduated pump which can be readily adjusted to any quantity of air required, from 1 to 700 cm. (or 1 to 43 cubic inches). (2) It is provided with a mercurial manometer, which indicates the intrapulmonary pressure and is an index to the peripheral resistance that is overcome by the insufflation (3) It is provided with an automatic cut-off which effectively prevents any backward leakage of air into the cylinder, and thus puts the inspiratory inflation of the lungs under the control of the operator, thus regulating the

¹ Rev. de Gynéc. et de Chir. Abd., July-Aug., 1901.

² Amer. Med., Jan. 18, 1902.

duration of the inspiratory act and thereby the rhythm of the respiration. (4) It is provided with an air filter interposed between the larynx and the pump, which purifies the air injected through the pump. (5) The inlet opening of the pump can be readily adjusted to a screened funnel and

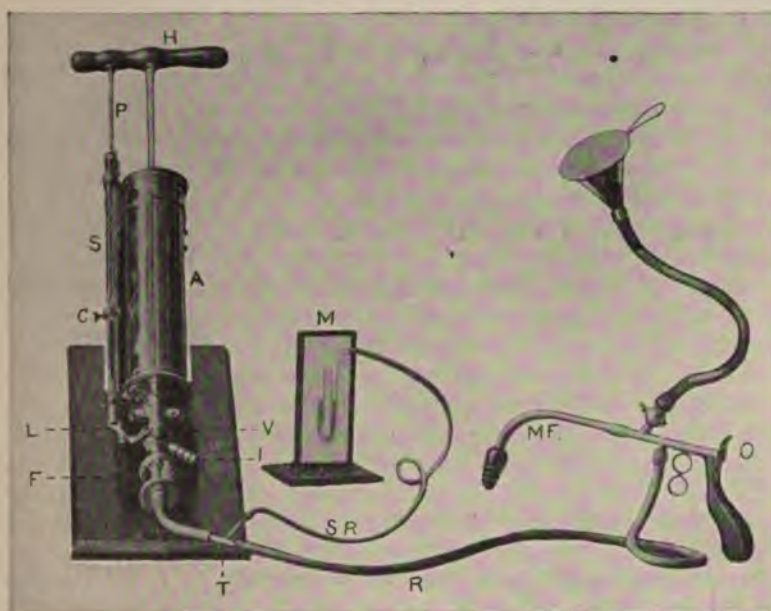


Fig. 27.—Single-cylinder pump for clinical use (Matas, in Amer. Med., Jan. 18, 1902).



Fig. 28.—Latest working model of apparatus for artificial respiration in medical and surgical practice (Matas, in Amer. Med., Jan. 18, 1902).

tube for further administration of chloroform or oxygen while artificial respiration is going on. (6) It is provided with an intralaryngeal cannula of the O'Dwyer type, with several adjustable conical tips for intubation. Our modified cannula differs from the O'Dwyer cannula in the

shape of the handle, which is pistol-shaped and gives a firm grip, and in having an opening guarded with a stopcock which is easily connected to a tube and funnel for the administration of chloroform while the patient is breathing through the intubating cannula. While insufflation is going on the stopcock is closed and the anesthetic is administered through the inlet in the pump."

An interesting case of **traumatic apnea or asphyxia** is reported by Burrell and Crandon.¹ The patient was a man 22 years of age who 1 hour before admission to the hospital was caught in a standing position between an electric car and a doorpost at the entrance of a car-house. His chest was compressed anteroposteriorly, no other part of his body being caught. In this position the patient was held for 3 minutes, when the car was removed and he fell unconscious. Upon admission to the hospital the patient's pulse was 100, respiration 30. His hands and nose were cold. There was slight bleeding from both ears and both nostrils, and blood had run into the mouth. The pupils were small, equal, and did not react to light. Knee-jerks were absent and other reflexes were diminished. The exact injury to the chest could not be ascertained because of the existence of a considerable area of emphysema. There was no vomiting. From the level of the third rib upward over the neck and face and into the scalp the skin presented a dusky bluish mottled appearance. The color of the skin became slightly paler upon pressure and returned to its former color slowly. Minute areas of normal tinted skin could be observed at various points. There was marked subconjunctival hemorrhage, which, however, did not extend to the parts covered by the lids. Minute retinal hemorrhages were observed. The patient's consciousness returned at the end of 4 hours and his pulse and respiration also improved. The urine had a specific gravity of 1028 and contained a large trace of albumin; the sediment consisted of normal and abnormal blood. A few days after the accident the urine was normal. The peculiar blue color of the skin did not begin to fade until 8 days after the accident, but was entirely gone on the eleventh day. The patient was discharged perfectly well a few weeks after the accident. The authors refer to a number of celebrated accidents in which people have been crushed to death by the pressure of crowds and presented symptoms similar to those described in this case. The immediate treatment of such cases consists in the performance of artificial respiration, and subsequently combating shock. Delay in the performance of artificial respiration has resulted fatally in numbers of cases.

Laryngectomy by the Roetter method is described by F. G. Harvey,² who thinks that this operation has many advantages over the older methods of doing a tracheotomy prior to the removal of the larynx. The author reports 6 cases; in 3 laryngectomy by the Roetter method was performed, and in 3 a preliminary tracheotomy was done.

Pneumothorax occurring during the performance of surgical operations is discussed by Delangénère.³ The author describes 6 cases

¹ Boston M. and S. Jour., Jan. 2, 1901.

² Lancet, Sept. 21, 1901.

³ Arch. Prov. de Chir., No. 12, 1901.

in which he shows the advantage to be derived from the intentional admission of air into the pleural cavity in exploratory operations and in the treatment of pulmonary growths or abscesses. When rapidly produced, pneumothorax is extremely dangerous; but when produced gradually, it is not accompanied by serious risk, and is of value in controlling certain forms of pulmonary hemorrhage. If serious symptoms arise during the production of pneumothorax, further ingress of air may readily be prevented by drawing a portion of the lung into the external wound and fixing it there by sutures. Any subsequent serious symptoms resulting from pneumothorax, such as dyspnea and a tendency to asphyxia, may be relieved by withdrawing the air from the pleural cavity by means of an aspirator. When the wound is completely closed, aspiration under these conditions causes the lung to expand. When the diagnosis of a pulmonary lesion is obscure and an exploratory operation is called for, it can be satisfactorily performed by first gradually establishing pneumothorax and afterward making a free exposure of the chest-cavity. The operation should be completed by the absolute closure of the thoracic wound and the withdrawal of the air by the aspirator.

Kortiweg,¹ of Leyden, reports a most instructive case of **foreign body in the lung** in which a **successful pneumotomy was performed**. The patient was wounded in several places by fragments of a lyddite-shell. This occurred on April 17, 1900. One of the fragments entered the right lung between the second and third ribs. After the injury the patient ran about 2000 paces. Not until several hours afterward, when all of his other wounds had been dressed, did he complain of any oppression in the chest. This oppression soon disappeared, however, and the patient was transported over rocks and rough ravines for 5 hours on the day after the injury and did not suffer from any symptom indicating an injury of the lung. This history is very different from that given by most writers on military surgery. The fact that so few symptoms were complained of is accounted for by the peculiar shape and size of the foreign body, which probably produced little hemorrhage. The wound in the chest rapidly healed and required no particular treatment. A few days after the injury some dirty and foul blood was coughed up, but the irritation and expectoration soon ceased. In June, however, the patient was suddenly seized with an attack of coughing and expectorated some pure blood. From this time on, frequent bloody expectoration took place. Six months after the injury the patient presented himself at Amsterdam. At this time any movement of the body or disturbance caused by riding in a car produced bloody expectoration. An x-ray examination revealed the foreign body back of the second rib about 7.5 cm. behind the front wall of the thorax. The exact position of the foreign body was easily determined by means of the x-rays. At this time the question as to the advisability of removal was discussed. Kortiweg differs from Kütner, who advises no interference unless the foreign body produces untoward symptoms. Hoffman has collected 160 cases of foreign bodies inhaled into the lungs, and in but one of these cases did a

¹ Ann. of Surg., July, 1902.

dubious cure occur without the foreign body being removed by extraction, by expectoration, or by suppuration. In 60 of these cases in which the body remained in the lung death ensued after a longer or shorter period. The author believes that in general "foreign bodies entering through the larynx, if they do not soon cause death by suffocation, may sometimes be borne easily enough for some length of time; that when they are smooth and round and not too large, they are commonly coughed out or removed by tracheotomy; that when angular bodies are soon removed by tracheotomy or by spontaneous expectoration the patient's condition may present a good prognosis, even if the objects have only been removed after months, when suppurating processes had already developed; that the longer the object remained in the lungs, the more serious the consequences were, and that in all cases in which the body definitely remained



Fig. 29.—Showing fragment of shell embedded in the lung. Anterior view (Kortlweg, in *Ann. of Surg.*, July, 1902).

in the lungs, the final result was the patient's death. Left to itself, any permanently retained body kills the patient slowly but surely. Nor is it difficult to see that it must necessarily be so." Operation undertaken for the removal of a foreign body lodged in the lung after pus formation has taken place is by no means a simple one. It is rare in such cases that there is any agglutination of the two pleural surfaces. Late operations may improve the patient's condition, but they do not effect a cure; this being true, it is natural that surgeons should attempt to remove foreign bodies before suppuration and bronchial ectasis develop. It is only, however, since the localization of foreign bodies by means of the x-ray that operation can be thought of with any hope of success. In the case reported there was undoubtedly a connection between the bronchial tree and the cavity occupied by the projectile, as was proved by the

continually repeated bleedings. Expectoration in this case was at first foul. At this time a brown suppurating phlegm was frequently brought up. The chance of the patient coughing up the foreign body seemed extremely small, and the formation of an abscess with the extrusion of the foreign body seemed equally improbable. Among Hoffman's 160 cases 7 are recorded in which the foreign bodies escaped after the formation of an abscess, and in each of these the foreign body was a grain of corn. No such cure is reported in the case of any other foreign body.

On the 17th of October the second rib was resected, and during the removal of the cicatrix between the ribs the pleura was opened. A damp tampon was applied and the patient was returned to bed. As neither the second nor third rib had been fractured the foreign body had undoubtedly passed between the two. For 10 days the patient was kept continually upon his belly lest the heavy splinter should come to lie at a greater distance from the front wall of the chest. On the 30th of October another radiograph showed the foreign body in its former position. On the next day a second operation was performed. The position of the foreign body was ascertained by the introduction of three pins, all of them parallel and at a distance of 2 cm. from each other. All struck against a hard object at a depth of 4 cm. Loops of thread were passed above and under



Fig. 30.—Fragment of shell in the lung. Posterior view (Kortiweg, in *Ann. of Surg.*, July 1902).

this spot as deeply as possible by means of curved needles and the lung tissue was divided. When the foreign body was reached, the opening was dilated by means of the finger and the foreign body was extracted. In addition to the fragment of shell, two pieces of cloth were removed from the cavity. The depth of the cavity was 11 cm. It was tamponed. On the day following the operation the patient coughed up some bloody sputum, and when coughing took place air passed out of the wound. On the 14th of November another piece of cloth was coughed up. On the 1st of December the wound was healing and there was no longer any

passage of air through the external wound. On the 13th of December the patient was discharged cured. A report of the patient was received on the 21st of August, 1901, stating that he was in excellent condition. The splinter of shell measured $4\frac{1}{2}$ cm. in length and about $1\frac{1}{2}$ cm. in thickness. It weighed 42 grams. "According to Tuffier's statistics (1897) and Arnold's paper (1899), this must be the second foreign body extracted from the lungs through an external wound, and this case of pneumotomy is also the second that may lay claim to the name of 'early' operation."

The **removal of foreign bodies from the air-passages** is discussed by DeForest Willard,¹ who reaches the following conclusions: "(1) Coughing should be encouraged; forcible inspiration restrained. (2) Inversion in the prone position as a domestic practice is advisable. (3) Laryngoscopy is helpful if the body is lodged at the vocal cords. It may be extracted by forceps or by laryngotomy. (4) If time permits, the x-ray may be brought into serviceable use for diagnosis. (5) Careful diagnostic investigation is important to determine the actual presence of an impacted body and its location. (6) Tracheotomy under local anesthesia should be the rule if the object is lodged at the bifurcation or in the bronchi. Tracheoscopy, suction, and forceps manipulation must be cautiously employed. Prolonged instrumentation adds greatly to the danger of pneumonia. (7) If extraction is not secured through the tracheotomy wound, the chest-wall should not be invaded unless an artificial respiratory apparatus like the Fell-O'Dwyer is at hand, and oxygen available. With the assistance of these appliances, however, the bronchus may be reached, anteriorly or posteriorly, since, by their use, rhythmic movements can be maintained. (8) Resultant abscess of the lung should be treated by incision and drainage."

Borchert² makes a contribution to pulmonary surgery based upon the cases of **pulmonary disease** operated upon in the Urban Hospital during 10 years. During this time there were 29 cases operated upon; in 21 of these the lung itself was the seat of operation, and in 8 the resulting empyema only was treated. Operation should not be undertaken in the presence of an acute inflammatory condition. The conditions calling for operation are acute and chronic pulmonary cavities which show no tendency to heal and give rise to suppuration and tissue necrosis; bronchiectatic cavities in the stage of ulceration or suppuration; and pulmonary abscesses. Operation should be undertaken when septicemia or pyemia seem imminent or when a tendency toward hemorrhage is present. The pulmonary cavities due to phthisis may be considered in almost every case beyond the aid of surgery. The cavities may be drained, but the operation has no influence on the disease of the surrounding parts. Pulmonary abscess should be drained as soon as the acute stage of the disease has passed and when no tendency toward recovery is present. It is a mistake to delay operation too long in these cases. Ulcerating and gangrenous bronchiectatic cavities of large size, of long duration, and presenting considerable discharge call for operative interference. In order that the operation may be successful the disease must be definitely

¹ Jour. Am. Med. Assoc., Oct. 26, 1901.

² Arch. f. klin. Chir., XLIII, 400.

located, must be within the possibility of the surgical cure, and the presence of secondary foci of disease in the same or other lobes of the lung must be excluded. Examination of the sputum is of the greatest importance in diagnosing pulmonary disease, but in abscesses which have not opened into the bronchi no discharge may be present. When the discharge is of mucous consistence, it points to bronchiectasis; when purulent, to a chronic cavity or abscess. Elastic fibers or shreds of tissue in the expectoration suggest ulceration. It is extremely difficult to locate the cavities positively and to estimate their size and multiplicity. Cavities resulting from acute pulmonary inflammation are usually single, while the bronchiectatic cavities are often multiple and the chronic gangrenous cavities are less frequently multiple. Exploratory puncture is a valuable aid in diagnosis, but when employed the surgeon should be prepared to do an immediate operation. It is sometimes difficult to tell whether the aspirating needle has entered a lung abscess or an empyema. If, however, the pus is the same as that coughed up, the supposition is that the needle has penetrated the lung-cavity. Borchert thinks that skiagraphy has not proved of much value as a diagnostic means. He believes strongly in the importance of obliterating the pleural cavity in the neighborhood of the lung abscess before opening the latter. Nature has frequently accomplished this, but when she has not, the visceral and parietal pleuræ should be sutured. It is important to expose a large surface of the lung. With the pleuræ protected an exploring needle may be introduced to discover the seat of the abscess and to act as a guide to its evacuation. The lung-tissue may be divided with a cautery and the wound dilated with the finger. In bronchiectatic cavities large blood-vessels may be encountered, and these may require ligation, cauterization, suturing, or firm packing. In one case Borchert found a number of macerated vessels passing through the cavity and was able doubly to ligate and divide them with the aid of cystoscopic illumination. The cavity should be drained by a tube protected with gauze and with light iodoform packing. Irrigation should be employed only in exceptional cases and the external wound should not be sutured.

The surgery of pulmonary abscess, gangrene, and bronchiectases following pneumonia is considered at some length by D. N. Eisendrath,¹ who presents 4 tables of cases collected from literature relating to these subjects. He concludes as follows: "(1) Both acute and pulmonary abscess and gangrene following pneumonia may develop immediately, and chronic and simple putrid abscesses, with or without bronchiectases, are more remote sequels of both croupous and influenzal pneumonia, especially the latter. (2) The most valuable points in the history are the etiology; the sudden expectoration, after an apparent crisis, of pure non-odorous pus in the simple abscess cases, or of fetid pus in the gangrenous variety. In the chronic cases there is usually a history of a pneumonia having preceded the condition at some considerable time previously, followed by expectoration of large quantities of pus, with exacerbations of fever, accompanied by emaciation and frequently clubbed fingers, etc.

¹ Phila. Med. Jour., Nov. 9, 1901.

(3) Signs of cavity are seldom present. The moist râles, especially of large metallic character, are the most reliable physical signs. The character of the sputum is also of great value, whether purulent or fetid. Elastic fibers are more frequently found in gangrene than in abscess, being comparatively rare in the latter. (4) The x-ray is only of confirmatory value, as it shows chiefly thickened areas of lung, and should not be absolutely relied upon. When it shows a shadow at the same point where the physical signs are present, it is of value. (5) The prognosis of abscess and gangrene following pneumonia, medicinally treated, is not very favorable. Many cases of both varieties can be successfully treated in a surgical manner by pneumotomy. One of the greatest difficulties is the exact localization of the focus. The statistics which I have gathered show a marked increase in the percentage of recoveries, especially in the cases which have been reported within the last 5 years, over that of the preceding 5 or even 10 years. The prognosis for the chronic cases is not so favorable. The patients are usually operated upon when in an emaciated condition, and the walls of the cavity are often rigid, so that they do not contract well after being drained, and the free communication of a bronchus with such cavities is also a great barrier. But statistics in this variety are also improving, especially when combined with excision of the affected portion of the lung."

W. J. Hearn and W. J. Roe¹ report a case of **abscess of the lung in which they performed a successful pneumotomy**. The patient was a man 24 years of age. The history of lung trouble dated back to the third or fourth year of his life. When he came under the care of the authors, he was suffering from a large abscess in the left lung which was imperfectly emptying itself through the trachea. Repeated explorations of the lung were made without revealing the abscess; but finally it was located in the lower back part of the lung and was found to have opening into it 2 bronchi, into which a probe could readily be passed, producing severe paroxysms of coughing when it reached the trachea. This abscess was drained by means of a tube, the patient improving after the operation, although requiring daily irrigation because of the excessive discharge and its foul odor. Palladium bichlorid solution was found more efficient in lessening the quantity of pus than any other remedy employed; permanganate of potash, pyoktanin, and formalin solutions could be used only for a few days because of the irritation which they produced. The patient readily coughed up colored solutions introduced through the tube. He continued to improve in general health during the two years subsequent to operation, but the discharge from the abscess-cavity remained profuse and offensive, causing him to urge that something further be done. After ether was administered a portion of the abscess-wall was excised and its margins sutured to a large opening made in the chest-wall. Marked local improvement followed this operation, and there was no longer any necessity for irritation or the wearing of a drainage-tube; the discharge, however, continued, but there was not the horribly offensive odor which was previously so distressing to the

¹ Amer. Med., July 20, 1901.

patient. No tubercle bacilli were ever found either in the pus or in the expectoration, and the authors believe this abscess to have been the result of a localized gangrene of the lung. No difficulty was observed in the administration of ether in any of the instances in which it was employed, nor did any unpleasant symptoms result from the employment of daily irrigation through the drainage-tube.

Oppenheimer¹ discusses **pulmonary embolus following operations for appendicitis**, referring to 5 cases. The onset of symptoms in all of these cases was sudden and occurred from the fifth to the thirtieth day after operation. The symptoms presented were dyspnea, anxiety, rapid circulation, and sweating. In 4 of the cases there was bloody expectoration. The patients all recovered. In discussing the cause of this condition Oppenheimer asserts that it cannot arise from veins cut or injured during the operation, since these empty through the superior and inferior mesenteric veins into the portal vein and not directly into the inferior vena cava. He believes that the thrombus is a "compression thrombus." Since there is a spontaneous tendency to cure, expectant treatment should be employed. Digitalis is dangerous in this condition; absolute rest is very essential, the patient resting in a sitting posture.

Schlatter² reports 2 interesting cases of **punctured wounds of the diaphragm**. In the first case the patient was admitted to the hospital the day after the injury was received. At this time he was anemic, was breathing rapidly, and had a quick, small pulse. Physical examination showed the wound of entrance to be situated between the ninth and tenth ribs in the mid-axillary line, measuring 1 inch in length and $\frac{1}{2}$ inch in width. The ninth rib with the corresponding intercostal artery had been divided, and at each respiration air whistled through the wound. Considerable emphysema was present. When the wound was enlarged, the right lung was found collapsed. Examination of the diaphragm showed a wound $\frac{3}{4}$ inch long. When the finger was introduced through this wound, 2 other wounds of the capsule of the liver were discovered. Bleeding from this source was controlled by pressure. Blood continued to pass through the diaphragmatic wound, however, and further exploration revealed a wound of the right kidney. The abdominal cavity was found to contain considerable clotted blood. The diaphragmatic wound having been sutured, the peritoneal and pleural cavities, after being cleared of blood, were closed. The second patient had received a small stab wound between the seventh and eighth ribs in the right nipple line. This was enlarged and a corresponding wound of the diaphragm discovered. In this case, however, the peritoneal cavity had not been entered. The wound of the diaphragm was closed, the pleural cavity cleared of blood-clot, and drained. Both patients made a satisfactory recovery.

C. B. Porter³ reports a case of **carcinoma** involving 3 ribs and a portion of the diaphragm in which successful excision was done. The patient was a man 41 years of age who had presented symptoms for 3½ months. At the time of operation the tumor was about the size of a

¹ Berl. klin. Woch., Feb. 3, 1902. ² Münch. med. Woch., Aug. 20, 1901.

³ Ann. of Surg., Aug., 1901.

cocoonut and lay in the anterior axillary line on a level with the eighth rib. A preliminary tracheotomy was done so that in case it became necessary the lung could be inflated. After turning up a large skin-flap the tumor, together with the anterior halves of the seventh, eighth, and ninth ribs and a portion of the diaphragm, was removed. The opening in the diaphragm was repaired by suture. The pleural cavity was drained. A few ounces of straw-colored fluid were evacuated from the pleural sac 35 days after operation. The patient was in good condition 16 months after the operation and showed no signs of recurrence. Microscopic examination proved the growth to be a medullary carcinoma having its origin in the rib. [The origin of a primary carcinoma from a rib is very difficult of explanation.]

Dunp¹ speaks of the present unsatisfactory **treatment of empyema**, which is due to tardy diagnosis, inefficient drainage, and poorly conducted after-care. The author usually resects 6 cm. of the eighth rib, just outside the angle of the scapula, thus insuring adequate drainage because of the low position of the opening, and allowing careful examination of the cavity because of its size. The fluid drawn off by the exploring needle should be examined bacteriologically whenever possible before operation is decided upon. If a pure pneumococcus infection be found, or if the fluid be a sterile serous exudate, such as is found in tuberculous empyema, repeated aspirations may be tried before doing incision. In large and double effusions gradual evacuations by paracentesis is advisable several hours before rib resection. Light chloroform anesthesia should be employed, or if there be contraindications to its use, the operation may be performed under Schleich's solution; ether should never be used. Wiping the cavity with gauze is more efficacious and less objectionable than irrigation. The indications usually given for lavage—abundant discharge, fetor, and fever—do not demand irrigation, but a free opening; for drainage gauze is preferred, as the opening soon contracts around a rubber tube. In the after-treatment attention to respiratory gymnastics is of great importance.

After a lengthy discussion of **thoracic injuries involving the lungs** and the report of 2 cases Le Boutillier² reaches the following conclusions: "Operative interference is not only justifiable but imperatively called for: (1) In distending pneumothorax from whatever cause. If aspiration or the introduction of a trocar does not give relief, thoracotomy should be done, and the lesions thus ascertained treated in appropriate ways. (2) In large hemothorax in cases of fractured ribs, contusions of the thorax without external wound, and penetrating wounds of the thorax without regard to the nature of the weapon producing the injury. (3) In extensive and progressive subcutaneous emphysema after thoracic injuries. The nature and extent of the measures to be resorted to must be determined according to the needs of the particular case."

¹ Jour. Am. Med. Assoc., Oct. 26, 1901.

² Ann. of Surg., May, 1902.

DISEASES OF THE VASCULAR SYSTEM.

Nietert¹ reports 2 instructive cases of **penetrating wounds of the heart**. The first patient was a well-developed man aged 22, weighing 180 pounds. Operation was performed 2 hours after the receipt of the injury. Unconsciousness took place almost immediately after receipt of the wound, and the patient was admitted to the hospital in a very serious condition. A stab wound was seen at a point corresponding to the fifth intercostal space on the right border of the sternum and was about $\frac{3}{4}$ of an inch in length. Only a small amount of blood escaped through the wound. The patient was absolutely unconscious, the pulse was imperceptible, and no apex-beat could be found; only feeble pulsation could be detected in the carotid and in the femoral vessels. Cardiac dullness was greatly increased, which, together with the fact that percussion of the chest showed no fluid in the pleural cavities, indicated bleeding in the pericardium. The cartilages of the fifth and sixth ribs on the right side were divided near the sternum and a considerable portion of this was removed by rongeur forceps in order to expose plainly to view the wound of the pericardium, which was found to measure $\frac{3}{4}$ of an inch in length and from which only a small amount of blood escaped, as the opening was obstructed by blood-clot. The exploring finger detected a wound of the heart-muscle and therefore the pericardial wound was increased to 2 inches in length. As soon as the incision was made the blood-clot spurted out of the opening, showing the high tension existing in the pericardium. The emptying of the pericardium was accompanied by a great improvement in the heart's action and in the patient's general condition. During the evacuation of the contents of the pericardium bleeding was controlled by pressure with the finger over the opening in the heart. The bleeding from this wound occurred chiefly during the diastole. The wound of the heart-muscle measured $\frac{1}{2}$ inch in length and was situated in the center of the wall of the right ventricle. In order to suture this wound the heart was drawn up by Kocher's forceps until the first suture was introduced; silk was employed as a suture material and extended down to, but did not include, the endocardium. While the wound of the heart was being closed the patient regained consciousness and conversed in a perfectly rational manner, saying that he suffered no pain. A small gauze drain was introduced into the pericardium and the external wound was closed. No injury of the pleura had taken place. The patient did well after the operation until symptoms of suppression of urine manifested themselves, and from this condition he died 33 hours subsequent to operation. Nietert concludes a discussion of his case by referring to 23 others in which the heart had been sutured. Nietert's second case was that of a negro, aged 27, who was admitted to the hospital 14 hours after the receipt of a stab wound of the left chest. The patient was suffering from marked shock and great dyspnea. His mental condition was that of semiconsciousness and no history of the injury could be obtained from him. A distinct splashing sound syn-

¹ Phila. Med. Jour., Dec. 14, 1901, and Interstate Med. Jour., Jan., 1902.

chronous with each systole was heard during auscultation over the precordial region, while the heart's action was turbulent and the sounds were not very definite. Normal lung sounds were remote and indistinct over the lower portion of the left lung. The diagnosis of penetrating wound of the heart was made, and the external wound, without the administration of an anesthetic, was slightly enlarged in order to allow of the introduction of a finger for the purpose of examination. The finger, which was readily introduced, entered the pericardium and discovered a wound in the left and posterior aspect of the heart. Then an osteoplastic flap, with its base toward the sternum, was turned back, revealing the pericardium, the patient having been anesthetized with chloroform. About $1\frac{1}{2}$ pints of blood was removed from the left pleural cavity and a gauze pad was placed over the lung to keep it out of the way. The wound of the pericardium measured about 1 inch and was enlarged to 2 inches in order to enable the operator to get at the wound of the heart; the wound of the heart was not probed, the flow of blood being constant, but "it appeared certain that the endocardium had been penetrated." The wound was then made accessible for suturing by pressing the heart forward by means of the middle and index fingers behind it. Two silk sutures completely controlled the hemorrhage, and the patient did well for 24 hours, when he became restless, and later delirious. No attempt had been made during the 14 hours elapsing between the receipt of the injury and the time of admission to the hospital to prevent infection of the wound, and therefore the subsequent infection of the pleural cavity can well be understood. The pericardial cavity, however, did not participate in this process. Nietert was obliged to resect a rib about 3 weeks after his first operation in order thoroughly to drain the left pleural cavity. The patient ultimately recovered. [We congratulate the operator upon his success in his second case, and so far as we know this is the first successful suturing of a stab wound of the heart reported by an American surgeon. Gibbon recently made an unsuccessful attempt to suture a stab wound of the right ventricle at the Pennsylvania Hospital. The case very closely resembled Nietert's first case. The man was admitted about a half hour after the receipt of the injury in an unconscious condition. The wound of entrance was through the fourth left costal cartilage. There was no blood in the pleura, which had escaped injury. The patient was pulseless when put upon the table. The third and fourth cartilages were resected and the pericardium emptied of blood, while further bleeding was controlled by pressure over the wound with the finger-tips. The patient died soon after the introduction of a traction suture.]

George Tully Vaughan¹ reports a case of **suture of a stab wound of the heart**, and presents a table of 26 cases which have been operated upon. Vaughan's patient was a negro 23 years of age who was admitted to the hospital in an unconscious but extremely restless condition. A stab wound could be seen close to the sternum on the left side which divided the fifth costal cartilage. The patient's condition was very

¹ Med. News, Dec. 7, 1901.

desperate and immediate operation was decided upon. Vaughan turned back a costal flap, exposing the pericardium, in which was found a wound 5 cm. long. This pericardial wound was increased and a large amount of blood removed from the cavity, at which time a wound of the left ventricle close to the interventricular septum was exposed, which measured 2.5 cm. and was shaped like the letter Y. Blood spurted from this wound with each contraction of the heart. Seven silk sutures were introduced which extended to, but not through, the endocardium and closely approximated the wound edges. The pleural cavity contained a large amount of blood. The pericardial wound was closed by a continuous suture; the patient died shortly after the introduction of this suture from loss of blood. Of the 26 cases in Vaughan's table, 9 recovered and 17 died. The left ventricle was injured in 12 cases; the right ventricle in 8; the auricle in 1 case; and in 5 cases the injured cavity was not mentioned. In 2 of the cases reported it is doubtful whether the heart-cavity was penetrated, and in one of the cases it is certain that penetration did not occur. In the fatal cases the operation was undertaken immediately or within an hour and a half after the receipt of the injury; in the successful cases 5 to 24 hours elapsed before operation was performed. These figures, however, only show that if a patient is able to survive his injury for a number of hours, the chances from operative interference are better. The immediate dangers from such an injury are hemorrhage, shock, and the entrance of air into the heart; and the subsequent dangers are pericarditis, empyema, and pneumonia. Vaughan concludes his discussion with the following: "(1) The time has arrived when a wound of the heart should be operated on with as little hesitation as a wound of the brain, with the expectation, under corresponding conditions, of getting equally good results. The mortality must inevitably be high—not from the operation but from the injury—especially if all cases, including desperate ones, be undertaken. Selection of patients who have survived 5 or more hours after receiving the wound would give a good percentage of recoveries, but such selection is not to be recommended. (2) In all cases of wounds in the region of the heart, with symptoms threatening life, an exploratory operation should be done by making an osteoplastic flap by dividing the fourth and fifth costal cartilages at their attachments to the sternum and the ribs about 1 inch external to their attachment to the cartilage, somewhat according to the method of Roberts. This flap turned up as a door on a hinge gives a good view of the pericardium and can easily be enlarged upward if more room is required. (3) While early and speedy operation is often essential to success, yet the importance of asepsis cannot be too strongly emphasized on account of the great danger of pericarditis and empyema. If there has been much hemorrhage, a quantity of physiologic salt solution, approximately equal in amount to the blood lost, should be injected into a vein while the surgeon is operating on the heart, if it has not been done sooner."

A successful case of heart suture is reported by Watten.¹ The

¹ Deut. med. Woch., Sept. 12, 1901.

patient was a man aged 23 who had received a stab-wound in the right side of the chest. Reaching his home after the accident he became unconscious, and a physician was called, who applied a few sutures to the external wound and a tight bandage to the chest, and then removed the patient promptly to the hospital. Upon admission the patient was extremely pale and had an anxious expression, and his respiration was frequent and labored; there were also occasional attacks of violent coughing. The pulse was rapid, irregular, and small. The external wound was situated in the fourth intercostal space on the right side, measuring about $\frac{1}{2}$ of an inch in length. Its inner extremity was within $\frac{1}{2}$ inch of the sternal border. At each inspiration air entered the chest, and when the patient coughed, blood spurted out. An absolutely dull percussion-note was obtained in the posterior axillary line while the patient was recumbent; the area of heart dulness was not increased, but the heart-sounds were scarcely audible. When the temporary sutures were removed, a large amount of blood and air escaped from the pleural cavity. An examination of the wound showed that the internal mammary artery was not injured nor was any injury of the diaphragm discovered. When the exploring finger was directed toward the pericardium, an opening was found in this sac, and through it a wound could be felt in the heart-muscle. Watten thought it wise, since the right pleura was already injured, to approach the heart wound from the right side. The fourth costal cartilage was resected and the internal mammary artery ligated in the third intercostal space. The third costal cartilage was separated and turned back with a triangular skin-flap. The pleural cavity was then wiped out with sponges. The pericardial wound, which measured about $\frac{1}{2}$ inch, was enlarged and two traction sutures passed through its edges in order to make the heart accessible. The wound in the heart was nearly $\frac{1}{2}$ inch in length, and from it dark blood trickled slowly. The upper extremity of this wound extended nearly to the base of the heart. The heart's action was very irregular and rapid, which rendered steadying of the organ impossible until 2 fingers were introduced behind it. Three interrupted sutures of silk were then passed into the heart-muscle and the wound closed. After the closure of the heart wound and the cleansing of the pericardium the heart's action became quieter. The pericardium was drained. The patient did well until the evening of the second day, when the pulse became rapid and the respiration interfered with; the gauze drain in the pericardium was removed and $3\frac{1}{2}$ ounces of bloody serum escaped. A small drain was reintroduced and the patient's condition improved. The pneumothorax rapidly disappeared and the patient's condition 7 weeks after the operation was practically normal.

Sherman,¹ in his surgical oration before the fifty-third annual meeting of the American Medical Association, discussed the question of **suture of heart wounds**, and presented a table of 34 cases which have been operated upon since 1896. Of these operations, 3 were done in 1896; 2 in 1897; 4 in 1898; 11 in 1899; 3 in 1900; 9 in 1901; and 2 cases have

¹ Jour. Am. Med. Assoc., June 14, 1902.

already been reported during 1902. With but 2 exceptions all the wounds were either incised or lacerated ones, the two exceptional cases being bullet wounds. In 32 out of the 34 cases the ventricle was the seat of the injury; the left 17 times, the right 13 times. The right and left auricle were each injured once. In nearly all the cases the pleura was injured, hemothorax resulting. Silk was the suture material employed in all the cases except 3, in which catgut was used. Interrupted sutures were used in a large majority of the cases. In 7 instances the pericardium and pleura were both drained; in 4 the pleura alone was drained, while in most of the cases the author either reports that the wounds were closed without drainage or makes no mention of the matter. Of the 34 cases, 5 died during the course of the operation and 10 shortly afterward. Of the remaining 19 cases, 13 recovered and 6 died. Sherman suggests that the deaths occurring on the operating-table can hardly be attributed to the operation itself, but rather to the loss of blood resultant from the injury. It is interesting to note that in the 19 cases which did not die during or soon after the operation the heart suture was successfully accomplished, and that none of these patients died as a result of secondary hemorrhage. In the 6 fatal cases death resulted from infection. In this connection it is notable that 4 of the 13 cases which recovered did so in spite of infection. Sherman believes that catgut will be as satisfactory in the future as silk. Elsborg has advised that silk should be used and that the suture should be interrupted and placed very superficially. In order to arrive at some conclusion regarding the best technic to employ in heart suture, Sherman has performed 11 experimental operations upon dogs. In producing the wounds of the heart-muscle he found that a nonpenetrating wound would during systole produce so large a spurt of blood that it might readily be mistaken for a hemorrhage from the heart-cavity itself. During the closure of the wounds Sherman found 2 long suspension loops of silk passed through the heart-muscle to be of great advantage in controlling the heart. In his experiments he employed sutures to and sutures through the endocardium. He found it impossible and quite unnecessary to introduce the sutures during diastole, as has been recommended. It was found very difficult to carry the suture through the endocardium. In one case, however, he accomplished it, and postmortem found the suture surrounded by a globular clot which was quite firm and white. So far as his observations went there seemed to be no difference between the results obtained from continuous and from interrupted sutures. During his work upon dogs Sherman was very much embarrassed by the necessity for keeping up respiration by artificial means, since there is no mediastinum, and when the thorax is opened the lungs collapse. All of his dogs died of infection, but in every case there was early and firm union of the wound-edges. One very interesting and instructive case referred to by Sherman is that of Izzi, in which the heart was wounded but not sutured and the patient recovered. Twenty-eight days after leaving the hospital, however, in attempting to lift a weight the cicatrix of the heart-wall ruptured and the patient died suddenly. In this case the wound

of the heart-muscle was closed by a clot which became organized, but there was no proper coaptation of the wound-edges. Sherman shows that for a foreign body to enter the pericardium without first perforating the pleura it must enter the sixth interspace close to the sternal edge and be directed almost directly backward. One factor which largely contributes to infection in these cases is the constant motion of the parts, the result of circulation and respiration. Of the 19 patients who survived the injury long enough for infection to take place, this complication did arise, and in 6 resulted fatally. A study of the cases relative to drainage shows that the mortality was about the same in those cases where drainage was used and those in which it was not. The author, however, is inclined toward drainage of both the pericardium and the pleura. The pleura may be drained through the same wound as the pericardium, or may be drained separately in the posterior axillary line.

Fontain¹ reports a case of **stab wound of the heart**. The patient was admitted immediately after the receipt of the injury, suffering from all the symptoms of intrathoracic hemorrhage. Operation was performed 2 hours after the accident. The chest was opened and a considerable amount of blood found in the pleural cavity. The lung collapsed and was found uninjured. The blood came from an opening in the pericardium; this was enlarged and a wound in the ventricle discovered and quickly closed with catgut. The pericardium was closed, as was also the wound in the thoracic wall. Pleuropneumonia followed by empyema developed after the operation and necessitated drainage. The patient's convalescence was also complicated by a phlebitis of the lower extremity. The patient ultimately made a satisfactory recovery and showed no heart lesion.

Thomson² reports a case of **rupture of the heart** which occurred in an insane patient. The point of rupture was the seat of a localized fatty degeneration resulting from an endocarditic vegetation. The first symptoms of rupture occurred 21 hours before death took place.

Lauder Brunton³ offers a preliminary note on the **possibility of treating mitral stenosis by surgical measures**. An examination of a markedly contracted mitral orifice will impress one with the hopelessness of ever finding a remedy which would enable the auricle to drive a sufficient quantity of blood through this small opening. The possibility of dividing the constriction with the knife has appealed to the author, and he has performed a few preliminary experiments upon animals and has tried to devise a suitable means of division by experiments on the cadaver. The recent operations upon the living heart for the purpose of repairing penetrating wounds of this organ have emboldened Brunton to suggest the possibility that before very long good results may be obtained in certain cases of mitral stenosis by surgical interference. [Besides the difficulties and dangers inherent in such an experiment, we might, if the operation were accomplished, substitute regurgitation for stenosis.]

¹ Rev. de Chir., Jan. 10, 1902.

² Brit. Med. Jour., Feb. 22, 1902.

³ Lancet, Feb. 8, 1902.

Kiliani¹ showed a patient at the New York Surgical Society whose **pericardium had been drained** at the German Hospital. The patient showed symptoms of acute pericarditis 18 days after his admission to the hospital. At the time of admission he was in the fourth week of an attack of acute rheumatic polyarthritis. Five days after the development of the pericardiac symptoms the patient suffered from marked dyspnea and the area of cardiac dulness was greatly increased. The respirations were 56 and the pulse was 160. At this time an exploring needle was introduced through the third intercostal space and 15 cc. of serofibrinous fluid were removed. Immediately, under local anesthesia, 1½ inches of the cartilage of the fourth rib were resected and the pericardium was opened. The cavity contained a large amount of fluid. Iodoform gauze drainage was employed. The pleura was easily avoided. The operation produced immediate relief of the dyspnea and the pulse dropped from 160 to 112 within an hour, and the temperature fell from 103.6° to 101° F. The patient recovered, but at the time of exhibition, 3 months after the operation, a mitral murmur was distinctly heard.

Tuffier² reports a most interesting case of **sacculated aneurysm of the ascending aorta** in which he **performed ligation**. The patient was a woman 40 years of age who presented a painful and pulsatile tumor in the third intercostal space close to the right border of the sternum. The pulsations succeeded the cardiac systole. The walls of the tumor were soft and easily compressed. After pressure was released the tumor gradually and slowly regained its previous size. A diagnosis of sacculated aneurysm was made and direct surgical intervention was considered as justifiable. The diagnosis was reached after a most careful clinical investigation aided by the x-rays and the sphygmograph. The tumor had rapidly increased in size in spite of careful medicinal treatment. The patient was in excellent general health but was in imminent danger of death from perforation of the aneurysm. The tumor was exposed by dissecting back a large flap of skin and muscle with its base toward the sternum. A portion of the third rib was removed and a portion of the fourth, which was attached to the tumor, was separated from the rest of the rib. The aneurysm was about the size of a big fist, sacculated, and projected into the anterior thoracic region. It was carefully separated from surrounding tissues and its point of communication with the aorta was found to be relatively small. This pedicle was ligated with 2 catgut ligatures close to the aorta. At one point the sac was quite adherent to the anterior wall of the aorta, which adhesion rendered the ligation of the pedicle difficult. It seemed advisable, because of this adhesion, not to remove the sac. Tuffier considers this a mistake in view of the fact that the patient died on the thirteenth day after operation from secondary hemorrhage due to gangrene of the sac and infection at the seat of the ligature. Although at the time of operation the walls of the pedicle seemed thin, at the necropsy 3 arterial coats were found which were quite healthy.

¹ Ann. of Surg., Dec., 1901.

² Bull. et Mém. de la Soc. de Chir. de Paris, No. 10, 1902.

Robert T. Morris¹ reports an interesting case of **temporary ligation of the abdominal aorta for the cure of aneurysm**. Ligation of this vessel has been performed 14 times. Keen reported a case² in which the patient survived the operation 48 days. Only 4 of these 14 ligations have been done since the introduction of antiseptic surgery. Morris's patient was a colored woman aged 24. The aneurysm was situated high up in the abdomen and was of syphilitic origin. The patient also suffered from a suppurative nephritis of the left kidney. The duration of the disease at the time of admission to the hospital was 4 months; the pulsation of the aneurysm was so marked that it was visible at a considerable distance from the patient's bed. An incision was made from the ensiform cartilage to the umbilicus. The aneurysm extended from the celiac axis to a point caudad from the mesenteric vessels. Morris performed a distal ligation of the aorta just below the aneurysm, and after allowing sufficient time for the aneurysm to fill with clot, decided to remove the ligature and allow the circulation to become re-established through the vessels below the seat of the aneurysm; for constricting the aorta he chose a soft rubber catheter 12 mm. in circumference in order to avoid injury of the tunica intima. The aorta was constricted until no pulsation could be felt in the femorals and then a long forceps was applied to fix the catheter. The forceps was used in preference to tying a knot in the catheter, the ends of the catheter and the forceps being allowed to protrude from the abdominal wound. The position of the ligature was 2 inches from the aneurysm and $1\frac{1}{2}$ inches from the bifurcation of the aorta. Thirty minutes was consumed in performing the operation, but most of this time was taken up in controlling hemorrhage in the subperitoneal tissues about the aorta. When the ligature about the aorta was tightened, the patient's pulse rose to 140 and was full and strong at the wrist, and the respirations rose to 48. Three hours after operation the patient's temperature was normal, pulse 120, and respiration 60; 9 hours after operation temperature was 100°, pulse 104, and respiration 36; at this time the patient's legs became warm for the first time since the operation, but she suffered intense pain in the lower extremities and complained of a feeling of numbness; urine and feces were passed involuntarily. Nineteen hours after operation a pin-prick could be felt over the vastus muscles, but the leg showed general loss of sensation; 22 hours after operation the aneurysm began suddenly to diminish, and in 1 hour seemed to have become about half its former size; 3 hours after this the aneurysm had apparently disappeared. The forceps and catheter were removed 27 hours after operation. The pulse increased to 140 and was regular as soon as the ligature was removed, but rapidly dropped to 60. Pulsation in the femorals was readily established; sensation in the lower extremities was restored, as was also control of the sphincters. The patient was now quieter and more comfortable than at any time since her admission to the hospital. However, on the next day, the third, the patient developed evidences of intense septicemia, dying 53 hours after operation. A postmortem examination was made and

¹ Ann. of Surg., Feb., 1902.

² Am. Jour. Med. Sci., Sept., 1900.

showed that the septicemia was due to gangrene of small portions of the intestine which had come in contact with the steel forceps; it was thought that the patient's kidney condition greatly reduced her resisting power, thus intensifying the septicemia. The aneurysm was a dissecting one involving the whole of the aorta from the celiac axis to below the mesenteric vessels; it was filled with solid blood-clot, but the aorta itself was patent. An embolus was found in the left internal iliac artery, although there was no evidence of injury to the internal coat at the site of ligation. This operation demonstrates beyond doubt what Morris claims for it: "That an aneurysm of the aorta can be made to fill with clots by the application of a temporary ligature to the aorta, and that circulation in the extremities may be re-established on the removal of the ligature." It is greatly to be regretted that the unfortunate complication of gangrene of the bowel, from contact with the steel forceps, should have resulted, since the object aimed at—namely, the filling of the aneurysm with clot and the re-establishment of the circulation below—had been accomplished. [This idea of distal and temporary ligation of the aorta for the cure of aneurysm suggests itself as a great improvement over the more obvious suggestion of proximal ligation, and the use of the rubber catheter also seems to be an improvement over silk ligatures or any of the various mechanical clamps devised for direct compression of the vessel. Morris's case reintroduces the interesting subject of operative treatment of aneurysms of the abdominal aorta which was so recently brought before the profession by Keen's famous case, and both these operators express the opinion that the time will come when ligation, either temporary or permanent, of this vessel will become an established treatment for this otherwise practically incurable condition. Morris appends a brief history of all cases operated upon to date.]

Rudolph Matas¹ deals with the subject of **traumatic arteriovenous aneurysms of the subclavian vessels** at great length, including an analytic study of 15 reported cases, one of which the author operated upon and reports minutely. A synopsis of the case operated upon is as follows: "A case of traumatic (gunshot) arteriovenous aneurysm of the right subclavian vessels, involving the artery within the scaleni; division of the artery between ligatures placed on the first and third divisions; detachment of the anastomotic connection; lateral suture of the venous orifice; osteoplastic resection of the clavicle under eucaïn B anesthesia; recovery, with partial loss of hand and forearm from artificial ischemia." The anesthesia in this case is interesting. Twenty minutes before beginning the operation the patient was given $\frac{1}{4}$ of a grain of morphin hypodermatically. During the first 2 hours of the operation local anesthesia was employed, but chloroform had to be substituted later because of pain caused by encroachment upon the deep branches of the cervical plexus, which could not be infiltrated. The operation was begun at 9.20 A.M. and was completed at 2.30 P.M.; much of this time, however, was spent in giving the patient rests, the actual work not consuming 3 hours.

The operation is divided into 8 stages as follows: *First stage:* Section

¹ Jour. Am. Med. Assoc., Jan. 11, 18, 25, Feb. 1, 1902.

of the clavicle at the junction of the middle and outer thirds. *Second stage:* Formation of osteoplastic clavicular flap. *Third stage:* Dissection and elevation of osteoplastic flap formed by clavicle, skin, sternomastoid, and subcutaneous tissues. *Fourth stage:* Exposure and preparatory control of the venous side of the aneurysm. *Fifth stage:* Exploration in search of the innominate and provisional loop around anomalous subclavian applied. *Sixth stage:* Detachment of the subclavian vein from the artery at the point of injury after failure to identify the third portion of this vessel outside of the scalenes on account of mass of exudate which masked it completely. Profuse hemorrhage from the artery at the anastomotic orifice, in spite of complete control of this vessel at its origin. Final ligation of the artery on each side of the bleeding point. Closure of the venous orifice by suture without obstructing the lumen. *Seventh stage:* Readjustment of flap; closure of wound; drainage. *Eighth stage:* The bullet was extracted by an incision over the anterior edge of the trapezius, and found to be a 38-caliber and absolutely undeformed.

The condition is summarized as follows: A continuous direct channel existed between the artery and vein which was the result of a primary hemorrhage occurring in the rigid and unyielding space between the scalene muscles. The vein was enormously distended and the circulation of the upper extremity was kept up chiefly by collateral circulation. The bullet had also caused a contusion of the brachial plexus which led to a paralysis of sensation and motion which was intensified by arterial ischemia of the arm. It is possible to restore the continuity of the subclavian vein by lateral suture after detaching it from the aneurysmal orifice. The possibility of gangrene of the extremity should not be overlooked in considering the prognosis and postoperative results. The advantages of massive infiltration of very dilute eucain and cocain solutions are well shown in this case. Matas recommends the use of chloroform, should a general anesthetic become necessary, as it is not accompanied by so much respiratory disturbance and overdilatation of the veins as occurs when ether is given. Stress is also laid upon the importance of administering morphin before beginning the chloroform anesthesia.

The cases presented show that although a large number of the patients may survive the immediate effects of the injury and of the arteriovenous aneurysm that follows it for a variable period of time, yet the lesion will exist in all the cases in spite of efforts to remove it, and even after a number of years will cause death. Notwithstanding this fact, Matas thinks that in all fully established arteriovenous aneurysms which are well tolerated and give rise to little trouble the old rule of nonintervention should be followed. On the other hand, it is believed that present-day surgery has greatly increased the indications for interference, so that in the cases not covered by the above rule operation with the view of extirpating the lesion is justifiable, particularly when the aneurysm is situated in the second and third divisions of the artery. In a letter of later date Matas adds 3 other cases, making the "total cases of arteriovenous aneurysm of the subclavian vessels reported, 18. Cases

treated expectantly or without operation, 12. Operated cases, 6. Of the 12 unoperated cases, 2 were fatal (Will's and Reboul's). Of the 6 operated, 2 were fatal (Wattmann, Vallas). Total mortality of the entire group, $\frac{4}{18}$, or $22\frac{2}{3}\%$. Mortality of the unoperated, $\frac{1}{6}$, or $16\frac{2}{3}\%$. Mortality of the operated, $\frac{2}{6}$, or $33\frac{1}{3}\%$. The prognosis as regards the viability of the limb still remains a debatable question to be determined by future observations; but it is evident, from the results of Veiel's case and my own, that a prudent reserve must be maintained on this important point before deciding definitely as to the comparative merits of expectancy and the radical operation in the group of cases last referred to. But even from this point of view it is evident, from the lessons gathered in my case, that further modifications of the technic will justify a far more aggressive attitude than in the past."

Matas's patient recovered with partial loss of hand and forearm from arterial ischemia.

Frederick Treves¹ discusses the **surgical treatment of arteriovenous aneurysms** and describes 4 cases the result of bullet wounds received in the South African war. Two of these were aneurysmal varices and 2 were varicose aneurysms. The superficial femoral vessels were involved in one instance; the popliteal at its bifurcation in another; the common femoral at its bifurcation in the third; and the internal maxillary in the fourth. All the patients recovered after operation. The great frequency of arteriovenous aneurysms at the present time is one of the results of the small caliber bullet employed in modern warfare. Spontaneous cure does not take place. Prognosis is more favorable in the varicose aneurysm, where the communication between the artery and vein takes place through an aneurysmal sac, than in the aneurysmal varix, where the communication is direct between the artery and vein. The prognosis of an arteriovenous aneurysm is not so grave as that of an aneurysm of the artery only. Gangrene and rupture are both infrequent. This form of aneurysm, however, produces more functional and local disturbance than does the arterial variety. Such changes as muscle atrophy, ulceration, edema, and rigid deformity of the part are likely to occur. These complications render operative interference imperative. Other treatment than the ligation of the vessels at the wounded point is condemned. The ligation of both vessels above and below the point of abnormal communication is the ideal operation, but this is not always expedient. When the condition is a varicose aneurysm, excision of the sac between the vessels should be performed.

Christopher Heath² reported at the Royal Medical and Chirurgical Society 2 cases in which he had **ligated the common carotid for an aneurysm of the arch of the aorta**, and also exhibited 4 specimens of similar cases which he has operated upon. The first case reported was that of a woman 61 years of age. The patient suffered a great deal of pain; she always sat up in bed with her knees drawn up and the head resting upon them. Whenever she attempted to lean back against the pillows, the dyspnea increased and the inspiration became stridulous.

¹ Brit. Med. Jour., May 10, 1902.

² Brit. Med. Jour., Feb. 15, 1902.

The left carotid was ligated without an anesthetic on November 16, 1890. Three days after the operation the patient was able to recline with comfort against her pillows. A week after the operation she was able to sleep for 7 hours consecutively. In February the tumor had decreased in size and the patient was able to lie and sleep in any position. She continued to improve, and was discharged in August. At this time the tumor and pulsation had greatly diminished. The patient died suddenly on November 23, 1891. The second case was that of a man aged 36. The patient suffered severe pain in shoulders, back, and neck. The aneurysm in this case was very extensive. The left carotid was ligated under local anesthesia on January 18, 1899. All the symptoms complained of prior to the operation greatly diminished, and the patient showed considerable improvement until about the middle of February, when he developed symptoms of acute phthisis, dying on March 21st. Mr. Heath claims that ligation of the left carotid undoubtedly produces an immediate effect upon aneurysm of the arch. [DaCosta recently showed a case before the Philadelphia Academy of Surgery in which he had performed ligation of the right subclavian and of the common carotid for an aneurysm of the innominate complicated by an aneurysm of the first portion of the common carotid. One year after the operation the man, who had been working for months as a blacksmith, was shown to the Academy. The innominate aneurysm and the carotid aneurysm in the root of the neck had apparently disappeared, but another aneurysm had developed at the point on the common carotid where the ligature had been applied.]

Marshall Clinton ¹ presents a preliminary report of a case of **abdominal aneurysm** in which prior to operation the symptoms pointed toward a distended gall-bladder. When incision of the abdominal wall was made, the tumor was found adherent to the peritoneum, and an exploring needle introduced revealed the fact that the tumor was an aneurysm, probably of the abdominal aorta. Prior to operation no thrill or pulsation or bruit could be heard over the mass.

Lancereaux and Pollesco ² present a communication on the **treatment of aneurysm by the subcutaneous injection of gelatin**, and assert that the reason this method has not proved more successful is the fact that it has not been used in the proper cases and that the number of injections have been too few and the amount of gelatin injected too small. Many cases of failure are due to its employment in the fusiform aneurysms. Frequently only 20 cc. to 30 cc. is injected instead of 200 cc. to 250 cc. The minimum dose of gelatin should be about 5 grams. The remedy is quickly absorbed if dissolved in normal salt solution. A decrease in the size and movements of the aneurysm is noticeable after the first dose, but it is only after repeated injections that a definite result is obtained. If the injection is made slowly, it is painless, and the proper aseptic precautions render it harmless. Several cases are referred to in which a cure or marked improvement has been obtained by this method of treatment.

¹ Buffalo Med. Jour., Sept. 1, 1901.

² Bull. et l'Acad. de Méd., July 16, 1901.

F. T. Stewart¹ reports a case of **ligation of the common carotid artery for hemorrhage from the cheek** which was followed in 12 hours by mental confusion, difficulty in talking, and slight impairment of motion in the right face, arm, and leg. These symptoms somewhat abated, but the patient died on the second day from the recurrence of hemorrhage. At the autopsy the brain was found normal; no thrombus was found in the carotid artery on either side of the ligature. Zimmerman states that cerebral involvement occurs in 26 % of common carotid ligatures; Riese, in 25 %; and Warren, in 20 %.

George W. Crile² submits an **experimental and clinical research on the temporary closure of the carotid arteries**. The dangers accompanying extensive operative procedures about the head and neck which result from hemorrhage, and also the high mortality resulting from cerebral complications if the common carotids are permanently ligated, are pointed out. Crile's experiments consist in 19 operations upon dogs and his clinical experience consists in 18 operations upon human beings. The histologic changes produced in the arteries of dogs by compression varied according to the degree of the pressure and the length of time during which it was employed. The vessels clamped for periods of from 15 minutes to half an hour showed little damage except a slight tearing of the endothelium. Some specimens clamped too tightly for 5 or 6 hours showed a marked degeneration of the middle coats, with edema, thickening, disarrangement of the intima, and with loss of endothelium and very marked narrowing of the lumen. In some of these cases necrosis was present and in others thrombosis. In those vessels where the pressure produced was only sufficient to close the lumen the histologic changes were unimportant. Some vessels were clamped from 24 to 48 hours without noticeable damage to the arterial wall. The presence of infection greatly increased the changes produced by closure. The physiologic effects from compression of one carotid were not very marked. The variation in the circulation consisted in a temporary increase of blood-pressure, while no effect upon the respiration was observed. In a simultaneous closure of both carotids the rise of the blood-pressure was more marked, but the normal level was soon regained. When the pressure clamp was removed, even after remaining in position for a number of hours, the circulation was readily re-established. In no case did clotting occur. In those cases in which no infection occurred the circulation was re-established and no impairment of any kind was observed. A careful study of the brain was made postmortem, and in none of the animals were either emboli or thrombi found, or were any other effects on the brain noted. These experiments upon animals taught Crile that it was necessary only to approximate the walls of the vessels, and that it was a mistake to compress them. For the purpose of controlling the circulation in the carotid vessels he has devised the instrument shown in the accompanying cut (Fig. 31). When operating upon human beings, the author's technic has been as follows: Twenty minutes before making the incision 0.01 grain of atropin is given hypo-

¹ Am. Jour. Med. Sci., Dec., 1901.

² Ann. of Surg., April, 1902.

dermatically in any case in which the technic is likely to involve interference with the trunks of the vagi or their superior laryngeal branches. This use of atropin prevents any inhibitory action upon the heart by interference with these nerves. Each common carotid artery is closed by means of the small clamp. The pressure exerted upon the vessel can be easily controlled by a screw which approximates its blades. The Trendelenburg position is to be employed in those operations in which there is danger of blood entering the pulmonary tract. An additional advantage from this posture is that it partially compensates for the lowered cerebral blood-pressure which arises from closure of the carotid. The one disadvantage of the position is an increase in the venous and capillary hemorrhage. This is offset, however, by the fact that the greater amount of blood in the venous trunks diminishes the danger of the entrance of air in case these vessels should be accidentally injured. The patient should be restored to the horizontal position before the clamps are removed from the carotids, in order that the cerebral blood-pressure may not be suddenly carried above the normal. The release of the vessels should be made slowly and a careful inspection of the field of operation for hemorrhage made during their removal. Among the 18 cases reported by Crile a number are of particular interest. Case III, for instance, consisted in clamping of both common carotids; partial resection of the



Fig. 31.—Crile's artery clamp.

tongue; removal of the floor of the mouth; excision of the submaxillary and sublingual glands; resection of the parotid; excision of the superficial and deep cervical

lymphatic nodes on the left side; resection of the buccal aspect of the inferior maxillary bone. Recovery followed. In Case IV, during the removal of a sarcoma of the parotid cardiac inhibition resulted from irritation of the vagus and recurrent laryngeal nerves. Crile attributes this complication to the employment of an insufficient dose of atropin prior to the operation. During the manipulation of the vagus the pulse dropped from 92 to 56. A piece of cotton saturated with 2% solution of cocain was then packed around the nerve, and although the nerve was subsequently submitted to much more extensive manipulation no further inhibition occurred, the cocain blocking the afferent impulses and protecting the heart. Case VII is epitomized as follows: "Closure of the common carotids; physiologic dosage of atropin; laryngeal application of cocain; excision of the tongue, epiglottis, left tonsil, floor of the mouth, lower jaw, submaxillary and parotid glands, left jugular veins, left external carotid artery, and the vagus nerve; but little shock. Easy immediate operation. Recovery. Death from secondary hemorrhage on the thirteenth day." In Case VIII both common carotids were closed in order to remove an angiosarcoma involving the cheek and neck of an infant 7 months old. Recovery followed. Crile presents the following clinical summary: "One or more carotid arteries were closed in 18 patients. Both common carotids were closed in 10; one common carotid in 5; one external

carotid in 3. In all, there were 28 closures of individual vessels. These were performed between the years 1897 and 1901. The ages of the patients ranged from 7 months to 69 years. There were no deaths attributable to the temporary closure of the arteries. In every instance the circulation was resumed immediately upon releasing the clamps. There were no appreciably late effects upon the vessel-wall at the point of clamping and none upon the circulation in the closed arteries and their branches. There were no later cerebral effects. Less anesthetic was necessary with closed arteries, especially in the cases in which common carotids were closed. In the latter case there may be embarrassed respiration, especially later. Wholly or partially releasing one or both carotids gave material and immediate assistance to the respiration. The operating time was much diminished, since the field of operation was quite free from blood. The amount of blood loss was strikingly less, as was also the difficulty in keeping blood from the respiratory tract. The application of the clamp may be accomplished through a very small incision and in several minutes. The proper interpretation of a slowed or of an accelerated pulse, or of an inhibited respiration, the prevention of either direct or reflex inhibition of the heart from mechanical stimulation of the vagus or its branches by the use of atropin and cocain, the safe and absolute control of hemorrhage by temporarily closing the carotid arteries, render operative procedures of the head and neck so much safer as greatly to increase surgical possibilities."

A discussion of **suture of wounds of large blood-vessels with a report of a case of suture of a wound of the axillary artery** is presented by A. E. Halstead.¹ The case reported was one in which the author was removing a recurrent carcinoma of the breast, and during the operation he accidentally cut through two-thirds of the circumference of the axillary artery. At the previous operation most of the collateral branches of this vessel had been divided, and it was thought that if ligation was done collateral circulation might probably fail to take place, and therefore digital compression was made on the proximal side of the injury and the wound closed with catgut sutures which passed through the two outer coats of the vessel. The wound healed and the patient left the hospital perfectly well at the end of 2 weeks. Two months after the operation the radial pulse on the injured side was as good as on the other. Halstead reviews minutely the history of the suture of wounds of the blood-vessels and discusses the technic of the operation. When more than one-half of the circumference of the vessel is involved, it is advised that an end-to-end anastomosis by invagination should be employed. This operation, however, is likely to result in a subsequent obliteration of the vessel from endothelial proliferation, but in the mean time the collateral circulation will have become established. Temporary ligation with silk or catgut, to prevent bleeding during the closure of the wound, should not be employed. In his experiments upon dogs the author has found great satisfaction in the employment of a tape twisted around the vessel until circulation is controlled and then clamped with

¹ Med. Rec., July 20, 1901.

forceps. In suturing longitudinal wounds of the arteries it is recommended that a continuous catgut suture should be used, passing only through the two outer coats of the vessel. After repairing the wound of the vessel the tissues in the neighborhood should be closely approximated and no drainage employed.

Pringle¹ records an interesting case of **stab wound of the external iliac artery** which he was able to suture successfully. The wound was situated on the anterointernal aspect of the artery and measured about $\frac{1}{4}$ of an inch in length. It was placed rather obliquely to the axis of the artery. The wound was situated $\frac{1}{4}$ of an inch above the origin of the deep circumflex iliac. The patient had lost a large amount of blood and was in a collapsed condition at the time of operation. The wound was repaired with catgut and the deep circumflex iliac tied. The closure of the wound produced a kink in the vessel, but no leakage took place. During the process of repair the bleeding was prevented by pressure upon the aorta. The patient made a satisfactory recovery, and 6 months after the operation was at work without any evidence of trouble at the seat of the injury.

Depage² reports an interesting case of **suture of the common carotid artery for an injury inflicted during the ligation of the external carotid**. The ligation was done primary to the removal of the tongue and floor of the mouth, which were involved in a cancerous growth. The injury of the common carotid was caused by a dissecting forceps. Immediate control was accomplished by means of hemostatic forceps and an attempt made to close the opening by a lateral ligature. This ligature, however, slipped off after a short time and hemorrhage was more profuse than before. Pressure was then made upon the vessel above and below the injury and 2 sutures of fine silk were passed through the outer coats of the vessel. When pressure was removed, the wound was found completely closed. The operation for removal of the tongue was continued, and the patient made an uneventful recovery.

A. Pearce Gould³ discusses **certain diseases of the blood-vessels** in his three Lettsomian lectures. In his first lecture he deals with **varicose veins**; their nature and importance, and the value of Trendelenburg's operation. The author takes the position that varices are essentially the result of overdevelopment of venous tissue, closely allied to, if not identical with, angioma. Although there are apparently many reasons for supposing varicose veins to be due to increased intravenous pressure the result of obstruction, yet this usually will not bear close inspection. The obstruction theory is rejected for the following reasons: (1) Varices appear before the growth of the individual is complete. Out of 50 consecutive cases of varicose veins of the lower limb, Gould found that in 41 the varices were observed before the age of 25 years. This is certainly not the period of life in which venous obstruction predominates nor the time in which strain is liable to tell upon the integrity of the vessel-walls.

¹ Scottish M. and S. Jour., Oct., 1901.

² Jour. de Chir. et Ann. de la Soc. Belge de Chir., Jan. and Feb., 1902.

³ Lancet, Mar. 1 and 15, and June 7, 1902.

(2) The general condition of the tissues of the subjects of varicose veins is usually surprisingly good, the varices occurring, as they do, so frequently in healthy young men applying for the army and navy service. (3) The conspicuous absence, in cases of varix, of the usual symptoms and consequences of venous obstruction is also a noteworthy point. (4) The result of excision of varicose veins, and also of ligation of the main superficial vein in which they empty their contents, is sufficiently satisfactory to weigh against the obstruction theory. If the condition arose from obstruction, the results of these operations would be fraught with no good. (5) The influence of pregnancy upon varicose veins is not that which is usually supposed. In a large number of cases Gould has found on close questioning that the varicosities existed prior to the pregnancy, but never gave rise to pain or discomfort until after pregnancy. Another point to be noted in this connection is that many patients complain of the varices at the very commencement of pregnancy, before the uterus has made any pressure upon the venous trunks. Out of 245 cases of varicose veins treated by Gould, 153 occurred in men. This fact also tends to discredit the obstruction theory. In support of the position taken by the author, he refers to the occasional combination of undoubted venous nevus and varix; to the capricious, irregular distribution of varices; to the early age at which varix usually develops; to the fact that varicose veins seem to be distinctly hereditary; to the striking innocuousness of varicose veins; and to the minute structure of a varicose vein. He believes that all the normal constituents of a vein are found in a varix, and are usually increased in amount. Together with this growth of venous tissue, there is usually a failure in the valve apparatus which allows regurgitation of the blood from the main deep veins into the deep superficial veins. Trendelenburg has pointed out this fact and Gould has frequently confirmed it. The effect of varices upon the nutrition of the part, either the leg or the testicle, is very small, if, indeed, it be at all perceptible. The symptoms and conditions attributed to varicose veins are believed to be entirely too numerous. Unless varicose veins give rise to trouble no treatment is required. The question of thrombosis is discussed in a later lecture. The Trendelenburg operation, which consists in the ligation and removal of a portion of the saphena vein at its point of entrance into the femoral, has been performed 120 times by Gould. With but few exceptions all the patients have stated that the pain has either been completely relieved or greatly lessened. Regarding the influence of the operation upon the veins themselves, the results have varied greatly. In some instances no effect was observed, and in others the complete disappearance of the varices. The operation greatly lessens or entirely removes the tendency to thrombosis. The foregoing statements are frequently illustrated by the reports of cases.

The second lecture deals with **obliterated arteritis**. Gould has met with this condition 9 times. He first refers to the importance of the inner coat of the blood-vessel, both from a physiologic and a pathologic point of view. The tunica intima is, in fact, the essential part of an artery. Disease of the inner coat, especially when the endothelium is

involved, quickly leads to thrombosis, which in small vessels at once obliterates the lumen. There are two agents which produce obliteration of arteries—new-growth and thrombus. The thrombus may be absorbed and disappear and the caliber of the vessel may be re-established, but a vessel once obliterated from subendothelial growth is never reopened. “The chief features of obliterative arteritis are these: (1) The disease originates in the subendothelial layers of the tunica intima of the smaller arteries. In its early stages it is marked by a small-cell infiltration which later organizes into a loose and vascular connective tissue. (2) This growth narrows the lumen of the vessel and may entirely obliterate it; more often, however, thrombosis occurs and the organization of the clot completes the permanent occlusion of the artery. (3) The disease beginning in the smaller arteries tends to spread in a centripetal direction and may reach even the largest arteries. The thrombosis it excites also often extends rapidly and far toward the heart, much faster and further than the changes in the vessel-wall, and the clot may thus spread as far as the aorta. (4) The earliest effect of this diseased artery is pain, then follow other evidences of local ischemia, and these may pass on to gangrene. These effects vary with the extent of the vascular obstruction and the efficiency of nature’s means of compensation. (5) The disease may be very chronic, slowly progressing for years, or it may run a much more rapid course. Having reached a certain point, arrest may occur and the symptoms may gradually pass away as the unaffected vessels become more and more efficient substitutes for those that have been occluded. (6) The disease arrested for a time may afterward recur in the vessels of the same limb or elsewhere, and it may attack more than one vascular area simultaneously. (7) The vascular changes are not always limited to the arteries and endophlebitis may precede or accompany the endarteritis, and the venous obstruction then modifies the effects produced on the tissues.” The following points are to be noted in obliterative arteritis: The extreme chronicity; the pain, which is generally severe; the ischemia, which varies in degree; the gangrene, which varies in type, according to the amount of venous obstruction which is associated with the arterial obstruction; the fever, which is usually present when the disease is active; and the condition of the other arteries of the body, which sometimes are found to be the seat of atheroma or calcification. The disease is more common in men than in women; it is a disease of adult life, not occurring in infancy or in old age. Gould’s youngest patient was 19 years old and his oldest 60. A number of theories regarding the cause of the condition have been advanced. The treatment in the earlier and less advanced stages of the malady consists in prolonged rest and local warmth; anodynes also may be necessary for the relief of pain; massage is also of value. In the acute stage massage produces too much pain to be employed. Small mummified areas may be left to separate naturally, especially when occurring in the hand. For more extensive gangrene amputation is necessary. The amputation should be done high above the gangrenous spot.

Gould’s third lecture deals with **thrombosis**. The blood-changes which

bring about this condition are: "(1) A change in the corpuscles leading to their disintegration; (2) an increase in the viscosity of the platelets; (3) an increase in the fibrin ferment; and (4) an increased liberation of fibrin ferment. It is possible that various microorganisms or their toxins may influence in some way or other either the formation of platelets from red corpuscles or the production of fibrin ferment in the blood. It is also possible that certain products of inflammation absorbed into the general blood-stream may have the same effect." The local conditions influencing thrombosis are the changes in the nutritive condition of the vessel-walls and the changes in the regular equable flow of blood. The changes in the vessel-walls include all traumatic, inflammatory, and degenerative changes of whatever origin. The circulatory changes result from the sudden dilation of a vessel, as is often seen in varix or aneurysm, the entrance of a small vein into a large one, or the little pouchings naturally present in veins behind their valves. Regurgitation from the deeper veins into the more superficial ones, resulting in the formation of varices, Gould believes to be a potent influence in the production of thrombosis. Another very important modification of the circulation is that brought about by great enfeeblement of the heart. Microorganisms have also been held to play an important part in the production of thrombi. Gould refers to several unusual forms of thrombosis, two occurring in the spermatic veins, and one occurring in a vein of a breast. He has also encountered cases of chronic spreading thrombosis to which he applies the name "endophlebitis obliterans." This condition has been seen only in the superficial veins of the lower extremity.

DISEASES OF THE LYMPHATIC SYSTEM AND OF THE THYROID GLAND.

Dudley P. Allen and C. E. Briggs¹ deal with **wounds of the thoracic duct** occurring in the neck, reporting 2 cases and presenting a review of 17. Injuries of the duct occur from tuberculosis or cancer, or from traumatism, either accidental or of operative origin. In one of the cases reported the duct was injured in the removal of tuberculous glands from the neck and was recognized by the typical grayish-white material which escaped. The tear in the duct was sutured and a small gauze drain placed over the wound; no leaking occurred subsequently. In the second case the duct was injured in removing carcinomatous glands from the neck and the injury was not recognized until after the operation, when a chylous discharge was observed. In this case the discharge gradually ceased. A review of the other 15 cases shows that in 2 of them the injury was due to accident and in 13 was the result of an operation. In 6 of the cases the injury was not recognized at the time of operation; in the remaining 11 it was. The discharge of lymph was quite profuse in 4 cases, was moderate in 5, and slight in 2. The subclavian vein was injured in 2 cases, and the external jugular vein in 2 cases. In the cases in which the injury was recognized at the time of operation the

¹ Amer. Med., Sept. 21, 1901.

wound of the duct was treated by ligation, suture, or packing. In the 5 cases which were packed the discharge continued in all but one instance; in the 4 cases in which suture was employed leakage occurred in 2; in the 1 case of ligation no leakage took place. Secondary operation was resorted to in 3 cases. Constitutional effects from the loss of lymphatic fluid were observed in 3 cases. But 1 death took place in the 17 cases. Packing is of great value in these cases, but must be closely and firmly placed. Diet after operation is important, and should consist solely of proteids, and all fat should be avoided. In order to avoid injury of the duct during operation it is suggested that the patient should be given 4 to 6 ounces of cream about 3 hours before operation. If the duct is injured during operation, it should be sutured, if possible, with fine silk or catgut. If it is impossible to suture the wound, packing should be employed, and in every instance the head should be placed at rest.

An interesting case of **injury of the thoracic duct** in the removal of **carcinomatous glands from the neck** is reported by Schoff.¹ The accident occurred in a woman 49 years of age upon whom an operation was being done for cancer of the breast. Injury of the duct was not discovered until the stitches were removed from the wound above the clavicle. At this time it was found that the wound was distended with milky fluid which appeared to be chyle. Firm iodoform packing was unsuccessfully employed to arrest the flow. Fifteen days after the operation the patient died as the result of an accumulation of chyle in the left thoracic cavity producing compression of the lung. The author has collected 19 cases of injury of the duct, but his own is the only one in which a chylothorax occurred.

Maitland,² of Madras, answers the objections made to the **operative treatment of lymphangiectasis of filarial origin**, reporting 3 cases which he has operated upon and referring to others. The objections that have been raised against operation are that it is unscientific in principle, as only a portion of the varix is removed and the obstruction to the circulation of lymph still persists; that the operation is frequently followed by lymphorrhagia; and that septic infection or erysipelas is apt to result. In each of the 3 cases reported the inguinal glands alone were involved. In the first case 4 years have elapsed since the operation and the patient has had no subsequent trouble. In the second case the patient was free from trouble for 9 years, during which time he was able to lead an active life, whereas prior to the operation he was completely invalided. The third case was operated upon in 1894 and is still free from trouble. The operation in two of these cases was done for periodic attacks of fever and pain. The results obtained answer the first objection made to the operation. A further answer lies in the fact that the varices are often quite local. In two of the cases the central portion of the lymphatic system was not implicated. In many of the operations the filarial worms themselves are removed with the varix. As regards lymphorrhagia, Maitland has never observed it, nor has it occurred in the experience of other surgeons in Madras. He has also never seen nor heard of a fatality from

¹ Wien. klin. Woch., Nov. 28, 1901.

² Brit. Med. Jour., Jan. 25, 1902.

one of these operations. The explanation of the pathology of the periodic attacks of pain and fever is still obscure.

James Berry¹ discusses each variety of **goiter, its symptoms and treatment**. The hardness sometimes met with in the parenchymatous form is usually due in young adults to excessive secretion, and can be relieved by the administration of thyroid extract or iodine. A fibroid or even a calcareous change may occur in this variety in old people, giving rise to a diagnosis of malignancy. A fibrous change in adenomatous tumors of the thyroid is frequent in patients past middle life, and the microscopic appearance of such a growth resembles very closely that of carcinoma. Its outline and the fact that the encapsulated tumor displaces the larynx and trachea distinguish it from the parenchymatous form. The not infrequent association of these two forms of goiter must, however, not be overlooked. The association can often be proved by the administration of iodine or thyroid extract, when the parenchymatous portion will contract and leave the tumor or tumors well defined. Such medication should be employed before attempting enucleation in any case of thyroid tumor. Circumstances which would justify operation in exophthalmic goiter are exceptional indeed. If any treatment is to be of avail in malignant disease of the thyroid, it must be instituted early in the disease. Berry says that "when in the thyroid gland of a person over 40 years of age a tumor appears which is hard, which steadily and rapidly increases in size, and which is not of an inflammatory nature, the malignancy of such a tumor should be strongly suspected." There is a rare form of sarcoma of the thyroid which may be mistaken for an abscess or a cyst. Its nodularity and its rapid growth are characteristic. In the early stages of parenchymatous goiter a pure water-supply should be provided, as it has been shown that impure water may produce the disease. Iodine and thyroid extract are useful in the early stage of parenchymatous goiter. These remedies may also produce some improvement in soft adenomas occurring in young people. The surgical treatment consists in extirpation or enucleation. It must be borne in mind that the operation of enucleation is suitable only for encapsulated tumors. This operation is best suited to cysts and adenomas of long standing, as they are likely to have tough, thick walls. In solid adenomas occurring in young people it is often better to extirpate than to enucleate. Extirpation is also preferable when there are many cysts or adenomas distributed throughout the gland. Only in exceptional cases should operation be done for parenchymatous goiter for deformity only. Dyspnea which does not yield to medicinal treatment is the indication for operation. Cases of exophthalmic goiter requiring surgical treatment are indeed rare. The excision of the cervical sympathetic ganglia for this condition is unjustifiable. Berry has lost but 1 case in his last 109 operations for goiter.

¹ The Lancet, May 3, 1902.

DISEASES AND FRACTURES OF BONES.

A. H. Tubby,¹ in a lecture on **delayed union, nonunion, and malunion of fractures**, says that, in addition to the length of time which has elapsed after the occurrence of a fracture, delayed union may be distinguished from nonunion by the presence in the former of loss of voluntary movement accompanied by pain on passive motion; absence of pain with retained power of voluntary motion indicates nonunion. The causes of delayed union are: imperfect immobilization due to splints wrongly or loosely applied; the position of the fracture, the proximal fragment in fracture of the upper femur, for instance, being specially difficult to control; the interposition of muscle, ligament, or synovial membrane between the osseous segments; lack of nutrition from tight bandaging; and general causes, as anemia, however produced, syphilis, rickets, phosphaturia, pregnancy, and scurvy. Senility, locomotor ataxia, and poliomyelitis, although predisposing to osseous lesions, do not interfere with the subsequent repair. Delayed union is treated by perfect immobilization and by measures directed toward improving the general health. The injection of irritating fluids, acupuncture, setons, electrolysis, subcutaneous section of the callus, and rubbing the ends of the bones together are condemned. Bone-joining through an open incision may be employed if nonunion be inevitable and the operation be not too dangerous. The mortality of operation for pseudoarthrosis of the femur is 20 %. The use of apparatus, on the other hand, is capable of making life bearable. Vicious union, excluding that occurring after fractures of the upper third of the femur and after fractures of the middle of the humerus, is very rare if treatment be carefully carried out. Severe cases should be operated upon, and slight cases may be benefited by apparatus.

F. C. Wallis² reports a case of **paralysis and atrophy of the muscles of the forearm** following an operation for the relief of congenital absence of the superior radioulnar articulations of both forearms, in which the Esmarch band was allowed to remain on the arm for 1½ hours, and in which marked effusion of serum into the tissues followed the operation. At the end of 10 months all the tendons on the flexor aspect of the forearm except the flexor carpi ulnaris and the flexor longus pollicis were lengthened by operation. Galvanism, massage, and passive motions were also practised, and marked improvement resulted. Although this condition is usually ascribed to ischemia, Wallis thinks that in the reported case the trouble was due rather to hyperemia, with the consequent exudation of a large quantity of fibrous-tissue-forming elements (serum). Before resorting to tendon-lengthening it is desirable to wait 3 or 4 months to ascertain how much power the muscles will regain, and also to allow the maximum of contraction to occur. If the tendons are lengthened before the contraction of the fibrous tissue is completed, the condition is certain to recur. The ultimate results are so good that operation should always be undertaken.

¹ Brit. Med. Jour., Dec. 7, 1901.

² Practitioner, Oct. 1, 1901.

Carl Beek¹ publishes a number of illustrations of **congenital osseous malformations**.

F. J. Cotton and R. H. Vose² call attention to the ease with which **fractures in children** may be overlooked, not because of the actual difficulties in diagnosis, but because the relative frequency of such fractures is not borne in mind. Often there is no disability or pain noticed. The x-ray demonstrates that fractures not infrequently exist with but slight symptoms, that mere cracks may be readily overlooked, that incomplete fractures or complete fractures without displacement are more common than was formerly supposed. In these cases there is nearly always some difference in the use of the limb on the two sides or some limitation of motion, which in some cases is due to reflex muscular spasm of the same sort as is seen in joint disease. Palpation always reveals localized tenderness. In small children, when there is a history of a fall or other trauma, and especially when the arm or shoulder girdle may be involved, the only safe way seems to be to assume a fracture as probable, till every inch of bone has been gone over carefully. Eighteen cases are reported.

William H. Bennett³ concludes a paper on the use of **massage, early movements, and posture in the treatment of recent fractures** as follows: "(1) When managed with ordinary discretion and with average dexterity, the result of the method is undoubtedly advantageous, inasmuch as the time elapsing before the patient is able to resume his ordinary vocation is diminished by at least one-third, partly by the increased rapidity of union which ensues, and to a great extent by the avoidance of the waste of time which occurs in correcting the stiffness and pain which so often follow upon the discontinuance of splints, in the majority of cases, treated by means of the classic method of prolonged splinting, etc. (2) The advantages resulting from early passive movements—an essential precursor of which is massage—are especially noteworthy, a fact which was fully elicited in an inquiry made by the present writer in connection with a communication read at the meeting of the British Medical Association at Ipswich in 1900, the evidence obtained proving conclusively that early passive movement is followed by a corresponding early return to the ordinary vocation of the patient. (3) The benefit of the method is remarkably demonstrated in fractures in which the chances of union are practically *nil*—*e. g.*, intracapsular fracture of the neck of the thigh-bone,—the indications being to obtain the best use in the damaged limb by insuring free movement and by preventing the wasting of the muscles concerned; in such cases massage and passive movements are indicated at once. (4) The dangers of thrombosis and embolism feared by some surgeons do not exist more than in fractures treated by prolonged splinting. Cases of embolism may have occurred in the course of treatment upon the lines under consideration, but the writer, whose experience of the method is probably larger than that of any other surgeon in this country, has met with no such case, although he

¹ N. Y. Med. Jour., June 29, 1901.

² Boston M. and S. Jour., Jan. 9, 1902.

³ Practitioner, Aug., 1901.

has seen 3 instances of embolism (1 fatal) in fractures managed by prolonged splinting. Thrombosis and embolism will from time to time occur in fractures however treated, a fact of which any surgeon of large experience must be painfully aware. (5) The method is not suited to those who lack discretion or who are defective in dexterity—a remark which applies with equal force to the majority of surgical methods; to such the classic treatment by prolonged splinting, whatever its disadvantages may be, is better adapted. (6) The principal disabilities attaching to the union of fractures in faulty positions, unless the displacement be gross or of the rotatory kind, are avoidable by the use of massage and early movements, by which the adhesions about the fracture are avoided. (7) The method is not to be regarded as a substitute for treatment by splints, on the one hand, or by operative measures, on the other, but should be used as a rational adjunct to each."

C. H. Golding-Bird,¹ in an article on **the operative treatment of simple fracture**, says that, contrasted with absolute immobility for weeks in splints, the arguments for fixing the bones through an open incision, together with removal of blood-clot and debris, is sound, but has been shorn of much of its weight now that the use of splints is getting more intermittent and massage to remove extravasated blood more universal. The time for disinfection of the skin is often limited, and to say that operation for a simple fracture is devoid of all risk is not strictly in accordance with fact. It is not a step to be lightly undertaken, especially by those whose principal professional duties are other than those of daily experience in operative surgery. It is the knowledge of the frequency of spiral fracture of the tibia which skiagraphy has been largely instrumental in affording us, and of the difficulties of its reduction, that lends one of the strongest arguments in favor of converting a simple into a compound fracture of the leg, for the purpose of fixation. Since the introduction of skiagraphy, however, the tendency has been to ignore all conditions except the exact coaptation of the fragments, irrespective of whether that adds to the complexity of the treatment or to the increased functional advantage of the limb. Certain surgeons have declared that the x-rays are the test by which they work, and that when a fractured leg does not show perfect coaptation on manipulation with a view to employing splints, the fracture in every such case should be cut down upon and approximated by some local means. If this be taken seriously, every fracture of the leg not absolutely transverse must come under the scalpel; but even after wiring or screwing a large proportion will still show some irregularity in outline. Bone-setting does not mean perfect coaptation, a condition not attainable except in the simplest transverse fractures. The skill of the surgeon lies not in producing a good-looking bone scar, but a sound limb, to outward appearances and in utility. The merits of the open treatment of simple fractures are not determinable by one fact only, but by all those results of its employment taken together which tend for the good of the patient: and the brains of the surgeon and the individuality of the case, such as com-

¹ Practitioner, Aug., 1901.

plete irreducibility of the fracture by simpler means, must and can alone determine the right course to adopt. The writer is of the opinion that the time gained in such leg cases as require open operation is not great enough to weigh much in deciding the question of operation, and when there is such a gain it is largely due to another factor than that of wiring the bones. Massage hastens the convalescence of a fracture, and when a surgeon operates on a fracture he largely does what massage achieves—removes the extravasated blood and trims the laceration of the soft parts. Pott's fracture accompanied by extreme extravasation of the blood and by comminution of the bone requires operation, as also do cases in which restoration of position cannot be maintained by splints. The pain following a Pott's fracture is due to want of passive motion. It may be questioned whether slight alteration in the lines of pressure in the bones is ever the cause of suffering in Pott's fracture. Reduction is not always easy, even though the surgeon can see what he is doing through an open incision. If the shortening does not yield to simple extension, the ends of the resisting structures should be approximated by suitable joint flexion, or the tendon or fascia should be divided. The best material for all-around bone work is silver wire. Screws loosen in time and become a source of irritation. A drill of the arrow-head type suitably tempered is the best and simplest instrument for boring holes. A single hole through the fragments does not give as much security as two holes through which the wire is thrust staple fashion, the protruding ends being twisted together. The writer operates on all transverse fractures of the patella by the open method and wiring. Subcutaneous methods may approximate the fragments, but they fail to cleanse the joint of blood and the fractured surface of the intumed capsule, and they have the additional risks of all punctured wounds. When exact alignment cannot be obtained in cases of separation of epiphyses, some form of operation must be resorted to.

John Poland¹ publishes a lengthy paper on **separation of the epiphyses**. The signs of a separated epiphysis are characteristic; the complications and sequels are different from those of fractures; and the treatment is often of an entirely distinct nature. There is an enormous preponderance in the number of separations in the male over those of the female, and the epiphyses of the upper are more often involved than those of the lower extremity. Of the single epiphyses, the order of frequency is as follows: upper epiphysis of the humerus, lower epiphysis of the radius, lower epiphysis of the femur, lower epiphysis of the tibia. Separations of the epiphysis without displacement, hitherto little recognized by surgeons, are extremely important, inasmuch as they are liable to be overlooked, to receive no treatment, and consequently to be followed by arrest of growth, periostitis, suppuration, etc. The signs of such an injury are swelling and pain about the epiphyseal region, mobility of the epiphysis, and occasionally soft crepitus or ecchymosis. The x-rays do not assist in the diagnosis, the appearance of the shadow being the same as that of the normal end of the bone. Many of the "growing

¹ Practitioner, Sept., 1901.

pains" in young children are due to juxta-epiphyseal sprains, and should not be considered lightly. Incomplete separation in infants favors the development of bacteria and may lead in tuberculous subjects to acute tuberculosis of the joints. An incompletely separated epiphysis may gradually become separated later, with the exhibition of more marked signs. When displacement is marked, the injury resembles a dislocation. Abnormal mobility at the epiphyseal line is the chief sign; muffled crepitus is characteristic, but is frequently absent from locking of the fragments or from the interposition of periosteum or muscle; it can be best felt during reduction. Rotation of the epiphysis in its displaced position is a fertile source of trouble in diagnosis and treatment, as it annihilates the ordinary osseous landmarks; the x-rays are here of the greatest value. Detachment of the periosteum from the diaphysis is a constant complication and a frequent source of difficulty in treatment. Separations heal more rapidly and with less deformity than fractures in adults, and nonunion is extremely rare. The cause of arrest of growth is the direct result of inflammation and destruction of the cartilage cells of the conjugal disc. The treatment of epiphyseal separation is often entirely different from that of fracture in the same locality; in separation of the upper epiphysis of the humerus, for instance, the locking of the pyramidal end of the diaphysis into the concave undersurface of the epiphysis would be impossible of reduction without proper anatomic knowledge. An anesthetic should always be administered when displacement is present to any great degree. The injured joint and portion of limb above and below are kept in position by a Croft's plaster-of-paris or other molded splint. Plaster-of-paris should never be used in children on account of the danger of gangrene. Massage should be commenced at the end of a few days in simple separation, and passive motion at the end of 10 days or 2 weeks. Active motions should also be encouraged at an early date. If operative measures were practised for the replacement of the separated fragments more systematically than at present, distortions would not be so frequent. For deformity following arrest of growth in one of the parallel bones of the forearm or leg, conjugal chondrectomy, or removal of the conjugal cartilage of the corresponding healthy bone, is carried out when the age of the bone is not too far advanced. Poland discusses each individual epiphyseal separation.

J. E. Platt¹ discusses **recent advances in the diagnosis and treatment of fractures of the upper extremity**. No marked advance has been made during recent years concerning fracture of the clavicle. Early massage without immobilization has been recommended by Lucas-Championnière. In regard to primary wiring of the bone, the author considers the operation to be attended with some risk and difficulty; he says that a scar is left in an objectionable situation, and that the results obtained by other methods are almost always perfect so far as the usefulness of the arm is concerned. In cases of compound fracture, however, the operation is justifiable. Separation of the upper epiphysis of the humerus is probably mistaken for dislocation of the shoulder in 50 % of the cases.

¹ Practitioner, Sept., 1901.

The upper surface of the diaphysis is convex and is traversed in an antero-posterior direction by a prominent ridge. In separation of the epiphysis the ridge upon the diaphysis is prone to hitch against the margin of the epiphysis, producing a locking of the fragments. For the reduction of this displacement steady traction should be exerted upon the arm in slight abduction aided by rotation of the humerus and direct pressure. Fractures of the anatomic neck of the humerus may be treated by early massage and passive motions after an interval of 24 hours. Rotary movements are not practised until the end of the second week; no splints are used except a protecting shoulder-cap, and no pad is placed in the axilla. The arm is carried in a sling. The best treatment for fractures of the surgical neck of the humerus consists in the use of an axillary pad, a shoulder-cap, and in the fixation of the arm to the side of the body by strapping. The hand should be carried in a sling, the elbow being unsupported. In all fractures of the upper two-thirds of the shaft of the humerus the arm should be bound to the side of the body. In all cases of fractures of the lower end of the humerus, except fractures of the internal epicondyle, the elbow should be flexed to a right angle and the hand placed in a supine position by the application of an anterior right-angle splint or a posterior gutter-shaped splint. In cases of fracture of the internal epicondyle an external angular splint may be applied. The treatment of supracondylar fracture by complete extension does not counteract the tendency to backward displacement. Splints should be discarded at the end of 3 weeks, and in young children at the end of 2 weeks; the author does not use passive motion, but after the splints have been removed advises active movements of the joint. Operation is recommended in comminuted fractures and in cases in which reduction cannot be accomplished by external manipulations. The most important cause of cubitus varus is an incomplete fracture of the lower end of the humerus, the fracture starting at or near the outer end of the epiphyseal line and afterward splitting the diaphysis longitudinally. Cubitus varus, although very unsightly, does not interfere with the strength and usefulness of the arm. Operation is advised in fracture of the olecranon when union has not occurred or when there is a subsequent loss of power. To check the tendency to bowing backward in fractures of the forearm, a narrow straight splint is applied to the inner side of the forearm in addition to the anterior and posterior splints. Fracture of the shaft of the ulna is apt to be complicated by dislocation of the head of the radius, and unless the radius is reduced the ulna will unite in bad position. Many special splints have been devised for the treatment of Colles's fracture. These are to a large extent unnecessary, the deformities following treatment being due to insufficient reduction rather than to the form of splint employed. The writer employs 2 straight splints, the anterior one reaching only to the wrist and the posterior to the knuckles; early massage and passive movements are strongly recommended.

Gallois and Piollet¹ have collected 11 cases of simple fractures of

¹ Rev. de Chir., July and Aug., 1901.

the clavicle complicated by lacerations of large blood-vessels. In 2 the internal jugular vein was injured; in 6 the subclavian vein, twice together with the subclavian artery; and in 3 the subclavian artery alone. Of the cases, 8 were fatal. In cases in which the vein is injured a large hematoma usually forms, and when a large artery is involved an aneurysm generally develops. Treatment consists in hemostasis through an open incision.

Milbradt¹ reports a case of **fracture of the humerus by muscular action.** The patient was a strong man aged 24 years whose right humerus broke just above the elbow while he was engaged in comparing his strength with that of a friend by placing the elbow on a table, clasp- ing his opponent's hand, and making efforts to press his opponent's hand to the table. The fracture is only to be explained by the contraction of the brachialis anticus.

Joseph Griffiths² concludes from a study of **Colles's fracture** in the cadaver that the most efficient method of reduction consists in complete flexion of the wrist; this position is maintained by strapping the forearm and hand to a metallic splint, very similar to that devised by Levis.

M. Maitland and P. Poillet³ report a case of **fracture of the pelvis** occurring in a man aged 60 years who fell a distance of 8 meters, striking on the right trochanter. The patient died subsequent to an abdominal section performed because perforation of the bladder existed. At the autopsy a fracture of the pectineal crest of the pubis, a fracture of the ilium, and a stellate fracture of the acetabulum produced by the impact of the head of the femur, were found. A sharp splinter of bone from the horizontal ramus of the pubis had perforated the bladder. The internal iliac muscle was also badly lacerated.

C. E. Ruth⁴ adds 8 cases of **fracture of the neck of the femur**, treated by the method advocated by T. J. Maxwell, to the 17 previously reported. He reduces the fracture by flexing the thigh upon the abdomen to relax the psoas and iliacus muscles and preclude the possibility of their being caught between the fragments, by vertical traction on the shaft of the femur, while it stands at right angles to the trunk, and by adduction to the normal line. The limb is dressed by a Buck's extension apparatus together with lateral extension of the upper portion of the femur toward abduction. The writer claims that by this treatment the patients are more comfortable, more easily bathed, and that they can use the upper portion of the body and the sound limb with greater freedom. He refers to a patient aged 70 years on whom this treatment was practised. The patient died at the age of 90, having had perfect use of the leg for 20 years, and at the postmortem perfect union was found to have taken place.

Robert Jones⁵ presents 6 skiagrams of **fracture of the base of the fifth metatarsal bone by indirect violence.** He has been unable to find any reference in surgical literature to a fracture of the fifth meta-

¹ Berl. klin. Woch., Feb. 17, 1902.

² Brit. Med. Jour., Dec. 7, 1901.

³ Dublin Jour. Med. Sci., Nov. 1, 1901.

⁴ Jour. Am. Med. Assoc., Dec. 21, 1901

⁵ Ann. of Surg., June, 1902.

tarsal by indirect violence. A diagnosis of this condition is rendered difficult because of the absence of crepitus, due to fixation of the fragments by the interosseous ligament or impaction. So powerful are the ligaments that a dislocation of the base of this bone is extremely rare. The symptoms of fracture are pain when the patient puts pressure on the toes or the inner side of the foot and when he flexes the toes or attempts to invert the foot. The swelling is generally localized over the point of fracture. There is usually no crepitus, no deformity, and no yielding on manipulation. "It is a cross-breaking strain directly anterior to the metatarsal base, and caused by body pressure on an inverted foot while the heel is raised."

Richard H. Harte ¹ presents a study of **fractures of the skull** based on 146 cases. Many children recover from unrecognized fracture. Ref-



Fig. 32.—Fracture near the base of the fifth metatarsal bone. Case 2 (Jones, in *Ann. of Surg.*, June, 1902).

erence is made to the danger of mistaking the normal fissures for fractures, and also to that of mistaking simple incised wounds of the periosteum for fissured fractures. Fractures of the base of the skull result more frequently from blows on the side of the skull than is generally supposed. The prognosis of fissures of the base is more serious because of the danger of infection through the air sinuses; it is also largely influenced by the extent of brain injury. The writer refers to a case of fracture of the base in which a dram of brain-substance escaped from the ear, and in which recovery with some impairment of brain function followed. It must be remembered in making a diagnosis of fracture of the base that rupture of the drum will produce hemorrhage from the external ear; the hemorrhage is, however, usually transitory. The escape

¹ *Ann. of Surg.*, Oct., 1901.

of cerebrospinal fluid, a pathognomonic sign, is usually not as great as the escape of blood, but often lasts for a longer period. Paralysis of the seventh and eighth cranial nerves is a frequent association of fracture of the base. Harte refers to a case under his care in which recovery took place notwithstanding the presence of paralysis of the fifth, sixth, seventh, and eighth nerves. The importance of differentiating coma due to a fracture of the base from that caused by alcohol is pointed out. The temperature is one of the most important differentiating symptoms, it being subnormal in alcoholic coma and slightly above normal in traumatic coma, except immediately after the receipt of the injury, when it may be subnormal from shock. Recovery from a basilar fracture is seldom ideal because of the likelihood of impairment of function of the cranial nerves. Out of 46 cases of basilar fracture, 35.5 % recovered; all cases in which the diagnosis was at all doubtful were excluded. The treatment of fractures of the base consists in rest, small doses of calomel, cold to the head, and disinfection of the adjacent air-passages. Harte advocates the employment of Dover's powders. In the treatment of fractures of the vault of the skull operation should be undertaken in all cases, even if no signs of compression have appeared; in cases of doubt the scalp should be incised for diagnostic purposes. After operation in cases in which drainage has been employed the dressings should be changed frequently in order to prevent any retention of pus and consequent infection of the meninges. All stellate and punctured fractures should be operated upon. Among the 146 patients in the author's table, in 26 trephining was employed, with 3 deaths, a mortality of about 11.5 % compared with a mortality of 51 % in the preantiseptic days.

J. P. Lord¹ reports a case of **osteomyelitis** in a man of 60 in which he was able to line the cavity in the bone a few weeks after operation by the implantation of Thiersch grafts. At the time the grafts were applied the cavity was lined with healthy granulation tissue. When healing had taken place, the cavity was 3 cm. deep. The author thinks his method will be found to be a quicker and more satisfactory one, when cosmetic results are not to be considered, than the older method of allowing the cavity to fill with new bone.

JOINT DISEASES AND DISLOCATIONS.

Hopkins² exhibited at the Philadelphia Academy of Surgery a case of **dislocation of the outer end of the clavicle** in which 4 months after the receipt of the injury he sutured the bones together with silk-wormgut (Fig. 33) and obtained a satisfactory result. The operator was careful in this case to place his knot over the acromion so as to prevent subsequent irritation from loads carried on the shoulder.

Moore³ urges the **open treatment for dislocation of the acromial end of the clavicle**. He refers to the unsatisfactory results obtained in this injury by the ordinary methods of fixation. He reports a case

¹ Jour. Am. Med. Assoc., May 31, 1902.

² Ann of Surg., May, 1902.

³ Ann. of Surg., May, 1902.

in which he has obtained a most satisfactory result in a young man of athletic tendencies by cutting down on the parts and suturing the clavicle to the acromion with silver wire. The findings about the parts exposed convinced the operator of the impossibility of thorough reduction without operation. The coracoclavicular ligaments were completely torn across; the acromioclavicular ligaments were also torn and left the outer end of the clavicle quite bare. The finger of the operator could be passed underneath the clavicle almost to the sternum without meeting with resistance. The portion of the acromioclavicular ligament which remained attached to the acromial process lay over the articulation with the clavicle and completely interfered with the reduction of the latter bone. Three silver wire sutures were introduced and the patient made a satisfactory recovery but for the fact that these sutures subsequently required removal. If another case presents, Moore will use chromicized kangaroo-tendon.

Shepherd¹ reports the case of a man aged 62 who applied for the treatment of a **subglenoid dislocation of the humerus** 5 weeks after the injury. During the manipulation of the arm by the author's assistant

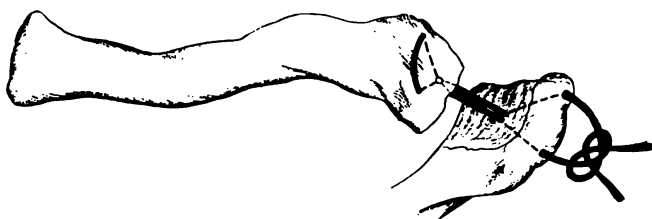


Fig. 33.—Showing X suture for acromioclavicular dislocation (Hopkins, in *Ann. of Surg.*, May, 1902).

the axillary vein was ruptured. Shepherd opened the axilla, tied the vein, and resected the head of the bone. It was found, however, that the tuberosities had been separated from the head at the time of the accident and that they occupied the glenoid fossa. Their situation in this position interfered with the proper position of the arm even after the head of the bone had been excised. When these portions of bone were removed, however, the arm came into good position. The patient recovered and developed moderately good function of the arm.

John G. Sheldon² discusses the **reduction of shoulder dislocations by continuous traction**. The principle of the method is that the muscles are relaxed and rendered passive by the continuous traction, and therefore offer no resistance to the movements of the humerus. The ligaments are so arranged and the capsule of the joint is so loose that no resistance is offered by these structures to the reduction. The weight of the extension is sufficient also to overcome the atmospheric pressure in the joint. Stimson first described this method. He carried it out by placing the patient upon a canvas stretcher having in it a 6-inch hole through which the dislocated arm was passed, the patient lying upon

¹ *Ann. of Surg.*, May, 1902.

² *Jour. Am. Med. Assoc.*, Sept. 14, 1901.

his injured side. A 10-pound weight was then attached to the wrist. In all cases reduction was completed in 6 minutes. Sheldon has modified this method by placing the patient upon an ordinary dining-table from which one leaf has been removed. The arm is then passed through this space and the necessary number of ordinary flatirons attached to the wrist or elbow. Sheldon carried out this treatment in 6 cases, the reduction in each being accomplished within 6 minutes. Apparently the dislocation was overcome in less than 6 minutes, but this could not be proved, as in each case the weights were allowed to remain for that length of time. It occurred to the author to employ muscular force as a substitute for the weights, and in 7 cases he has pulled gently and steadily on the arm held at right angles to the body, instructing the patient to relax the muscles, and in each case reduction was accomplished without difficulty. In no case was it necessary to keep up the traction longer than 4 minutes, and apparently traction for a shorter time brought about reduction. In none of the author's cases and in none of Stimson's cases did the patient complain of pain, and in none was there evidence of injury to the soft parts. The method has never failed in the author's hands, and possesses the advantage of rendering anesthesia unnecessary. Sheldon thinks that there is nothing in the objection made by some that traction on the arm at right angles to the body is liable to produce injury to the vessels and nerves. The traction employed must be gentle and continuous. [In Kocher's method of reduction by manipulation the principle of tiring out the muscles is utilized and the operator makes gentle and persistent external rotation until the muscles relax, when the other movements are carried out and the reduced bone is replaced in its socket.]

Hofmeister¹ describes a method of **reducing shoulder dislocations** which in principle is the same as that recommended by Stimson and Sheldon. It consists in the application of an extension apparatus and weights which will produce vertical extension. The extension cord passes over a pulley and about 11 pounds of weight is applied. More weight is gradually added, if necessary, until the contraction of the muscles is overcome. With the relaxation of the muscles the head of the bone is brought to the edge of the glenoid cavity, into which it either spontaneously slips or is pushed. Hofmeister found that from 15 to 45 minutes was necessary in order to accomplish reduction. He claims for the method an entire absence of danger.

A table of 59 cases of operation for **internal derangement of the knee-joint** is presented, with a discussion of the subject, by Allingham.² In the first place, it is shown that a great variety of lesions may be found after a diagnosis of internal derangement has been made, and that these conditions are not confined to the semilunar cartilages. Sometimes, although no abnormality is found, the operation will prove successful in relieving pain. Before opening the knee-joint an accurate diagnosis of the condition is very difficult. Great stress is laid upon the importance of early treatment in these cases, and it is said that if

¹ Beiträge zur klin. Chir., Bd. xxx, Sept. 2, 1901.

² Lancet, Mar. 15, 1902.

upon the onset of symptoms the joint is merely put at rest for a period varying from 1 to 3 weeks, and if rest is followed by massage, passive movements, and properly selected exercises, operation can be avoided in a great number of cases. In a certain percentage of cases, however, this treatment will not prove successful, and if this is the case operation should be resorted to; all chronic cases, too, require operation, and also those in which a loose body can be felt to move to widely different positions in the joint. In operating the author prefers to make a vertical incision about 3 inches long, 1 inch to the inner side of the patella and extending to an inch below the head of the tibia. An exception to this rule is made, of course, in cases of foreign bodies which can be definitely localized. Since it does not divide the extension of the vasti toward the tibia, and because the extension upward of the incision permits of an examination of the large synovial pouch about the patella, the vertical incision is better than the transverse. No drainage should be employed, nor should the joint be washed out with antiseptics. Irrigation of the joint with sterile water, when a foreign body has evaded discovery after a careful search, will sometimes cause the body to float out. The author prefers to remove loose semilunar cartilages rather than to fix them. The after-treatment consists in putting the joint at rest for one week, when passive motion should be begun if the wound is entirely healed, and massage can then be instituted; but if, in spite of this treatment, the joint tends to become stiff, it must be moved under an anesthetic. When the semilunar cartilage is involved, there is usually a distinct history of injury; a definitely located site of pain on the inner or outer side of the knee-joint; no foreign body is palpable; and no creaking can be elicited in the joint. Generally the results from this operation have been satisfactory, although occasional stiffness and pain have sometimes followed. It is extremely rare for the trouble to recur after operation. The author is careful not to minimize the gravity of the operation, which is held to be considerable, and says that occasionally failure must follow the operation.

Robson¹ reports 21 operations for **fractured semilunar cartilages**, 4 for **loose semilunar cartilages**, and 8 for **loose bodies in the knee-joint**. In a number of the cases there was no history of injury. A large proportion of the cases of internal derangement of the knee-joint are said to be cases of fracture or rupture of the semilunar cartilages, and that such a condition may be brought about from simple extension of the joint after flexion in a cramped position. This will account for the absence of a history of traumatism in many cases. In recent cases it is advised that the cartilage be reduced and the limb fixed for a month or 6 weeks, the treatment being the same as if the bone were broken. If the disturbance recurs, or if the patient suffers from continued weakness in the part after such treatment, operation becomes advisable. In the cases where this treatment of rest to the part has not been employed, and in which there is a history of repeated recurrences of the displacement, operation should be urged. Robson recommends an oblique in-

¹ Brit. Med. Jour., April 12, 1902.

cision extending from the lower and inner border of the patella downward and backward, which opens the joint without dividing the ligament of the patella or the internal lateral ligament of the joint. When the knee is flexed, the cartilages are brought into view, and if rupture has taken place the loose portion should be removed with scissors; if it is only loosened, it is sutured to the internal lateral ligament or to the head of the tibia. Irrigation of the joint or exploration of it with the finger is condemned. The function of the knee after the operation of fixation or the removal of the cartilage is usually perfect.

Dislocation of the semilunar cartilage is discussed by J. M. Cotterill,¹ his remarks being based upon 15 cases in which he has operated. The term "internal derangement of the knee-joint" is preferred to the more modern one of dislocation of the semilunar cartilage. The condition results when the knee is partly flexed and the tibia rotated externally. The internal cartilage is usually the one affected. Inability to extend the leg is one of the most important symptoms. Flexion is only occasionally interfered with. In sprains of the joints, however, extension is painless and flexion painful. The seat of pain shifts in "loose bodies" in the knee-joint, while flexion and extension are interfered with irregularly. Flexing, rotating outward, and then extending the leg is the best way of accomplishing reduction if the internal cartilage is the one affected; after reduction the joint should be put at rest for several weeks, otherwise recurrence is apt to take place. Operation should be performed, if no contraindication is found, upon a patient who is under middle age and who wishes to lead an active life, provided he suffers from repeated recurrence. Cotterill, in opening the joint, prefers to make his incision considerably above the line of the cartilage, and does not believe in suturing the dislocated cartilage into its normal position, but advises that all of the loosened portions should be removed. Drainage should not be employed and asepsis should be perfect. At the end of the third week, the joint having been fixed 2 weeks subsequent to operation, the patient should be allowed to get out of bed and use crutches or canes. No violent exercise should be indulged in for 4 or 5 months.

Arthur E. J. Barker² presents a clinical discussion of **dislocations of the semilunar cartilage**. In all of 17 cases operated upon for this condition the internal cartilage was the one displaced; in all of these cases, too, the cartilage was split in the directions of its fibers, and in none of them was the cartilage torn across. This latter lesion, however, is said to occur, and Barker refers to Korte's 3 cases. The splitting of cartilage is described by Barker as being "peripheral," "central" (either of which may be partial or complete), "partial anterior," and "partial posterior." In one case of complete central tear of the cartilage upon which Barker operated the inner portion was found curled up against the crucial ligaments and only attached by its ends. In another case upon which he operated he found a flat pedunculated growth attached to the inner edge of the cartilage which produced all the symptoms of a dislocated cartilage. Dislocation of the semilunar cartilage is supposed to be due to some

¹ Lancet, Feb. 22, 1902.

² Lancet, Jan. 4, 1902.

congenital slackness of the ligamentous mechanism of the joint in many of the cases. From a study of the mechanism of the joint during operation it is found that the cartilage during flexion moves more or less backward, and that during extension of the knee it moves forward again. Flexion and eversion of the tibia would seem to offer the most favorable conditions to dislocation. Barker does not think it possible to restore the cartilage to its proper position and keep it there when it is split throughout its entire length and only attached by its extremities, since it will invariably become again displaced as soon as the knee is flexed. In such cases total removal of the meniscus is perfectly justifiable, although in several cases an excellent and permanent result has been obtained by careful suturing. It is in the incomplete cases that rest and support are productive of cure. In cases of "central splitting" it is proper to remove the loose portion of the cartilage, and in such instances the outer portion fulfils all the needs of the semilunar cartilage. Barker describes his operation as follows: "To operate on these cases, the incision I have always used is one commencing over the inner border of the ligamentum patellæ about half an inch above the articular border of the tibia and carried with a curve downward and outward to the anterior edge of the internal lateral ligament. The lowermost edge of the flap so formed should lie about half an inch below the articular border of the tibia. The cut should be firmly made and divide the periosteum at the same time. The flap must now be raised with the periosteum until the edge of the cartilage appears under the attachment of the meniscus, which, if partially attached, will rise with the flap until its *under* surface is seen. If partially torn anteriorly, it can then be stitched to the periosteum with a few silk threads. When the periosteum is now laid back in its place and secured there by silk stitches, the meniscus becomes firmly attached to it. The rest of the wound is closed without drainage." Much comfort is given to the patient by applying an ice-bag over the dressing for the first week, and this method probably prevents much effusion into the joint. These 17 cases are made up as follows: 6 cases of complete internal dislocation; 5 cases of partial anterior peripheral dislocation; 3 cases of partial posterior peripheral dislocation; 2 cases of central complete dislocation; and 1 case of polypoid tag. Illustrations accompany the author's paper.

H. M. Rigby¹ reports a case of **recent perineal luxation of the hip** in which death occurred suddenly under chloroform anesthesia just as the dislocation was reduced. An interesting feature of this case is the fact that Rigby was able to do an immediate dissection in the region of the dislocation, an advantage that is rarely given the surgeon. There was extensive effusion of blood beneath the great gluteal muscle. The greatest damage was inflicted upon the quadratus femoris and obturator externus muscles. The diagnosis of perineal luxation was made on the following symptoms: extreme flexion, abduction, and feeling the head of the bone in the perineum. The diagnosis was confirmed by the post-mortem examination. Some lengthening was present, but this sign is of

¹ *Lancet*, Jan. 25, 1902.

doubtful value because of the difficulty in making comparative measurements of the two limbs. The postmortem examination revealed nothing which would account for the death.

C. A. Wright,¹ in a clinical lecture, discusses **septic polyarthritis**, referring to 3 cases. The study of these cases shows that the affection is one which attacks many joints, although it may begin in a single joint; that it lasts for a long time, even years; that it may give rise to the most complete crippling; that it shows no tendency to cause extensive suppuration, or even suppuration at all; that it may leave a joint intact; that it may subside or recur repeatedly; and that it does not give rise to any nodular, bony, or cartilaginous outgrowths or to hydrarthrosis. The soft parts near these joints may become inflamed and the skin and nails may be apparently the seat of trophic changes. The general health of these patients is gravely impaired. Wright shows that this condition is not of rheumatic origin. Conditions of joints closely resembling these are sometimes seen as sequels or complications of typhoid fever. The author believes that the cases reported are instances of polyarthritis due to sepsis. The source of infection in two of the cases referred to is thought to be of leukorrheal origin, and in the third case to absorption of poisonous material from the genital tract by reason of disturbance of the menstrual process by cold and fatigue. Inflammation of the joints of similar origin has been referred to by other writers. The treatment consists in curing the source of infection and putting the joints at rest, applying soothing applications to them, and giving potassium iodid.

Keetley² reports a case of **tuberculous elbow** which he treated by **erosion of the articular surfaces**. One month after this operation the joint was again opened and the articular surface of the humerus covered with gold plate. The plate was removed 2 months later, having caused no irritation. Four years after the operation the joint movements were excellent, extension being only slightly impaired.

VENEREAL DISEASES.

The special Committee of Seven, selected by the Medical Society of the County of New York to prepare a report on the subject of the **prophylaxis of venereal disease** in that city, presented the result of their labors at the meeting on November 25, 1901.³ A complete summary of this report appears in the "Medical News," December 21, 1901. The committee was composed of the following gentlemen: Drs. Prince A. Morrow, Ludwig Weiss, George B. Fowler, Charles W. Allen, L. Duncan Bulkley, Henry Dwight Chapin, Edward D. Fisher, and S. Adolph Knopf. "With regard to the question of decreasing the dissemination of venereal diseases by direct legal regulation of prostitution, the Committee agree that it is out of the question. Not only is the temper of our people very much opposed to what they would inevitably consider compounding vice, but also legal regulation has in the countries where

¹ Lancet, May 11, 1902.

² Brit. Med. Jour., Dec. 7, 1901.

³ Editorial, Med. News, Nov. 30, 1901.

it has been tried proved almost universally a failure. It is much more probable that the laws regulating prostitution will be repealed in the countries where they now exist than that any other countries shall join the movement which many former advocates now admit to be doomed to fail.

"With regard to segregation of prostitutes in one part of the city as a means of checking the evil it engenders, moral and physical, the Committee are of opinion that this, too, cannot be accomplished under present conditions. It can scarcely be done without some approach to legal toleration of the evil. This will inevitably seem to be a quasi-authorization and will meet with decided opposition from a large class of our people. With regard to domiciliary segregation, however, this question is different. Moral and immoral tenants must not be allowed to occupy the same premises. Above all, families with children must be protected from contact with and contamination by immoral neighbors. For this no special legislation is required. The enforcement in moderation of existing laws will accomplish the purpose very fully. The Tenement House Commission is at present doing excellent work with regard to the most serious features of domiciliary contamination, and their efforts must be encouraged. The Committee are agreed that all external signs of the presence of evil must be rigorously suppressed. All red lights, street or window solicitation, indecent exposure, etc., must be completely suppressed.

"With regard to the enactment of a penalty for the transmission of syphilis, while admitting the difficulties in the way of enforcement of the law, the Committee feel that the presence of such a law on the statute-books would be of great educative value, as well as occasionally enabling justice to be meted out to a criminal. As it is mainly the younger prostitutes who convey syphilis, the enactment of a law raising the age of consent is suggested. Procurers not only do a great moral evil, but also a great physical wrong, since their victims are destined, not only to become affected themselves with venereal disease, but to become foci of infection for others. The laws in this matter must be enforced to the utmost and the public conscience aroused by every possible means to encourage the detection and the unmitigated punishment of these criminals.

"The Board of Health as at present constituted has not only the right, but the duty, to control contagious diseases. There is no good reason why their efforts should be limited to the less widespread and less dangerous diseases of this class. Venereal diseases are eminently contagious and are calculated more than any others to undermine the health of the community, and especially of its most valuable members, young adults. The Board of Health must be aroused to a sense of its responsibility in this matter and all possible measures for the protection of health must be enforced. This seems the most natural way to get at the gradual suppression of the evil. Patience will be needed for the accomplishment of lasting good.

"Meantime there remains the educative influence that the medical

profession can exert upon the community. The declarations with regard to the dangers of venereal disease and the difficulty of its cure must be very straightforward. Young men must be plainly told that sexual continence is consonant with health and sexual indulgence absolutely unnecessary. The necessity for prompt treatment must be insisted on, and public opinion must be brought to understand that every dispensary and hospital receiving public aid should provide treatment for venereal diseases. On the other hand, the impression that venereal diseases are easy of cure must be removed. All advertisements of secret sure remedies, of special infallible prescriptions, and of venereal quacks, who never fail to cure, should be absolutely forbidden, not only in the public prints, but also in the form of posters in public places."

Ferd. C. Valentine,¹ in a paper on **the examination of a genito-urinary patient by the general practitioner**, lays stress on the importance of carefully questioning the patient regarding his family and previous history. Precedent syphilis may be the foundation for the involvement of the urethral adnexa, in which local treatment will be futile, unless supplemented by antiluetic medication. Residua of apparently cured gonorrhea must always be suspected. During the local examination the practitioner should protect himself from contagion; his arms should be bared to above the elbows, his clothing should be protected by a gown, and his eyes should be protected by spectacles, even though he has no visual defect. Ideal examinations are made in the morning before the patient has passed his first urine. The best substitute, therefore, is to instruct the patient to hold his urine as long as possible before the time appointed for the examination. The patient should stand before the physician and the trousers and drawers should be dropped to the knees for inspection of the genitals, the thighs, and the chest and abdomen if necessary. The appearance of an eruption on the latter may expose unsuspected syphilitic infection. Stains on the clothing serve as diagnostic signs. The shape is circular or ovoid in urethral disease; irregular diffuse in after-dribbling of urine from stricture; shred-shaped or band-like in seminal discharges. The edges are sharply defined from excess of urethral secretion; undefined in dribbling after urination; elevated from seminal discharges. The size is small from excess of urethral discharge; large, in dribbling after urination; variable, from seminal discharges. The color is homogeneous throughout in excess of urethral secretion; darker at the center than at the periphery in after-dribbling; deeper in spots, owing to varying thickness, from semen. Microscopic examination will reveal the real character of stains. If pus is exuding from the urethra, the penis should be wrapped in a gauze bandage so that in continuing the examination none of the discharge will be carried on the surgeon's hands to other portions of the patient's body. The inguinal glands and the scrotal contents should next be investigated. To demonstrate the minimal excess of urethral moisture, the examiner takes the left corpus cavernosum with the fingers of the left hand, and the right corpus cavernosum with the left thumb. The left little finger

¹ Jour. Am. Med. Assoc., Mar. 1, 1902.

is thus turned to the patient's pubis. In so holding the penis care is taken that neither the thumb nor fingers project below the corpora cavernosa. The right index-finger is then semiflexed and its middle phalanx pressed through the scrotum to the lower margin of the pubis. As it is drawn forward it compresses the urethra tightly, and so propels to the meatus any excess of moisture. The color of a urethral discharge changes when it dries on a patient's garments or on the cotton which he wears over the glans. If the discharge is colorless, the stain is starch-like; if opaline, it is grayish; if white, it is a yellow stain; yellow, a green stain; a green discharge, a reddish-brown stain; and if the discharge is red, there is a mottled dark-brown stain on the clothing. Stains may also be due to injections. A specimen for microscopic examination must be taken with a platinum loop. After being air-dried it is fixed in a flame and stained with eosin followed by methylene-blue. When the specimen thus stained contains no bacteria, it is wise to stain another with carbolfuchsin in order to determine whether or not tubercle bacilli are present. The urine, of course, should be carefully examined chemically and microscopically. The meatus should be cleansed before passing urine for examination. For rough office-work the 3-glass test suffices. The patient is ordered to pass about 3 ounces of urine into as many tubes as he may need to empty his bladder. The first specimen may be crudely assumed to contain all the washings from the anterior urethra; the second and subsequent specimens carry any abnormal additions from the bladder; the last specimen contains such additions as can be expressed from the adnexa of the posterior urethra-prostate, seminal vesicles, etc., by the final extrusive efforts. The manner of urinating is often pathognomonic. Neurasthenics may be unable to pass urine when watched. Any aberration in the manner of urinating must be permanent in order to be pathologic. Delay in starting the stream indicates prostatic enlargement, deep stricture, or a growth within the bladder; reduction in the size of the stream means stricture; interruption of the stream—"stammering urination"—suggests prostatic enlargement, a growth or foreign body in the bladder; and dribbling after urination implies beginning prostatic enlargement, or oftener stricture. The capacity of the bladder and the amount of residual urine should be estimated and the kidneys palpated. To examine the prostate and seminal vesicles, the finger is coated with the following mixture: Copal 2, Venetian turpentine 4, sulfuric ether 100, collodion 100, and acetone 8. This dries almost immediately and forms a perfect sheath which in no wise compresses the finger or obtunds its tactile sense. The epithelia found in the urine are indicative of the locality of the lesion. No instrumental ingression of the urethra should be attempted without most thorough efforts at rendering it aseptic. The meatus, glans, and prepuce are cleansed with bichlorid 1 : 6000; the urethra is cleansed by irrigating with boric acid solution; the clean urethra is filled with a 5 % emulsion of iodoform in glycerin; and after instrumentation, the urethral irrigation should be repeated. The soft bougie-à-boule is the only instrument that can be used for tactile exploration of the urethra; it is purely a diagnostic

instrument; the rigid sound is wholly a therapeutic instrument. Urethroscopy with a modern instrument is not difficult; cystoscopy requires more practice. Cryoscopy is the study of the dissolved bodies, based upon the observation of the point of congelation of their solutions. Cryoscopy is a laboratory method and its place is not a purely clinical study.

G. Frank Lydston¹ concludes an article on the relation of the caliber of the urethra, and especially of the meatus urinarius, to vesicle tone, as follows: "(1) The normal vesicle tonus depends upon a certain degree of physiologic obstruction to the urinary outflow. (2) The structural and functional integrity of the vesical walls depends upon this same resistance. (3) The resistance is normally most marked at the meatus, although the entire urethra is a factor in its production. (4) This resistance is both elastic and inelastic at different points in the urethra, and in varying conditions. (5) An exaggeration of this resistance produces atony of the bladder in old subjects, hypertrophy and exaggerated power in the young. Exceptionally, it produces atony in the young, but, as a rule, only as a reflex neurosis. (6) A marked diminution of this resistance, such as results from urethrotomy, and especially meatotomy, produces vesical atony of greater or less degree. (7) The foregoing should be borne in mind by the surgeon, and, in certain cases, the resistance of the meatus preserved by careful operative technic. (8) In most cases the resulting atony is of little moment, but it is always worthy of consideration, and in some cases of sufficient prominence to be worthy of serious attention. (9) In cases in which a free urethrotomy has been performed, it is wise to instruct the patient to compress the meatus somewhat during micturition, so as to maintain the normal vesical tonus by offering sufficient resistance to the outflowing urine properly to exercise the vesicle muscle."

W. H. Prioleau² writes on the meatus urinarius in genitourinary diseases. The meatus is in no way indicative of the caliber of the canal which connects it with the bladder. Stenosis of the meatus is most frequent in those circumcised in infancy. The anatomic meatus is at the end of the glans penis, but the surgical meatus extends to the posterior boundary of the fossa navicularis. A urethra often has a large anatomic and a small surgical meatus. A tight meatus may be responsible for hypertrophy of the prostate, the straining incident to urination causing an engorgement of the prostate in common with the other pelvic organs. Gonorrhea in a patient with a small meatus will surely produce complications. Meatotomy should not be performed, however, in the presence of active inflammation. A gleety discharge may disappear after a meatotomy. In a number of cases the meatus may be dilated; in those not amenable to this treatment the entire glandular urethra should be incised from within, under local anesthesia, until it is 4 or 5 sizes larger than it is intended to make the meatus. The wound is dressed with gauze placed in the urethra until the cut is healed.

¹ Amer. Med., June 31, 1902.

² Virginia Med. Semi-Monthly, Feb. 21, 1902.

G. Frank Lydston¹ thinks **perineal section for stricture of the urethra** offers a permanent cure in a large proportion of cases when thoroughly done, involving division of all fibroid tissue, both on the floor and roof of the canal, and, when necessary, the excision of encircling rings and nodules of fibroid tissue. He believes that in many instances strictures are tortured into a recurrence after perineal section by the too assiduous use of sounds. It is wise in every indubitable case of traumatic stricture, in which complete relief from symptoms cannot be obtained by the sound, to perform perineal section, and if adventitious tissue be excessive, to excise it. Irritable and resilient strictures in the bulbomembranous region frequently require perineal section because of the pain, spasm, hemorrhage, and fever which is apt to follow the introduction of a sound. Strictures complicated by fistulas or severe cystitis demand perineal section. In impermeable stricture when the urethra cannot be found in the perineum, except by tedious and extensive dissection, it is far better to make a suprapubic cystotomy and perform retrograde catheterization.

William K. Otis² describes a **urethroscope** which gives an illumination of the field not found in any other type of instrument. It gives the entire field of the tube used, offers no obstruction to the use of applicators, and at the same time nothing is inserted into the urethra which cannot be rendered thoroughly aseptic by boiling. It is simple in construction, strong, inexpensive, and fulfils all the indications of a good, practical, working instrument. "It consists of a metal tube, $1\frac{1}{4}$ inches in length by somewhat less than $\frac{1}{4}$ inch in diameter, the first half inch of which is narrowed down conically to form a funnel-shaped diaphragm, leaving an opening of a $\frac{1}{4}$ inch in diameter through which the rays of light emerge. At the other end of this tube is a second tube of the same diameter forming an elbow at right angles to the first tube, $\frac{3}{4}$ inch in length, into which the handle of the instrument fits. The funnel portion unscrews from the upper tube and a planoconvex lens is placed at this point to concentrate and direct the rays of a small electric lamp placed immediately behind it. This lens can be readily removed for cleaning. The handle consists of a cylindric piece of hard rubber, about $\frac{1}{2}$ inch in diameter and $1\frac{1}{2}$ inches long, to the upper end of which is fixed the electric lamp, while the lower end is arranged to receive the cords leading the current from the battery. A milled wheel on one side of this handle makes or breaks the current. Two small screw-heads are seen on the other side of this handle; the upper serves to clamp fast the hood, the lower to fasten the lamp in position. The lamp differs from the others in a special preparation of the filament which enables it to give out a very intense light without a corresponding increase in heat; it is unusually strong and capable of withstanding a current of from 16 to 20 volts. It is attached to a wire running through the center of the handle, so that it may be raised or lowered and clamped in position by the lower screw. The only adjustment which may be necessary is, when changing the lamp, to see that the filament of the new lamp comes exactly

¹ Amer. Med., Feb. 22, 1902.

² Med. News, Dec. 14, 1901.

opposite the center of the lens; a small piece of brass with a pinhole in it has been placed on the handle behind the lamp socket, so that by holding this to the light and moving the lamp up or down until the filament is exactly across the center of the hole, the lamp may be clamped in the correct position. A strong wire connects the instrument to the urethroscopic tube by means of a simple joint. The length of the handle and the weight of the instrument, both of which have been criticized favorably and adversely, depend entirely on the whim of the operator, as the handle may be lengthened to any extent or entirely done away with, while by a slight alteration in material and construction the weight (less than 1 ounce) may be reduced to a few grains."

Frederic Griffith¹ has devised an **instrument for determining the prognosis of urethritis**. "The instrument may be constructed from the ordinary metal bulbous bougie and of various sizes, to fit the urethra snugly. Removing the bulb from the wire handle, it is to be counter-sunk until the edge is at the greatest enlargement of the head of the instrument, forming thus a cup with ample space for specimens, when screwed or soldered to the shaft. Inserted gently, with the least possible lubrication, the instrument will reach any depth of the urethral canal, and by a rotating, scraping movement will detach specimens as it is withdrawn."

Ramon Guiteras² extends the term **sexual neurasthenia** to include all cases in which the lesions of the genital tract are found to be the source of trouble. He emphasizes the importance of a thorough examination of the genital tract in all cases of neurasthenia, even though the patient does not ascribe his trouble to that region. The source of irritation may be congenital or acquired, and may be situated in any part of the genital apparatus. The treatment is both local and general.

Louis E. Schmidt³ says it is not unusual to observe acute relapses in the course of chronic urethral disease. He calls especial attention to **urethral reinfection from the bladder**. Dilation, massage of the posterior urethra, irritating instillations, and the imbibition of alcoholic beverages, as well as the sexual act, will not cause a relapse in these cases. The urethra is normal to the urethroscope, but cystoscopically the following conditions are found: The trigone is the seat of a chronic inflammation, the characteristic luster is lost, the vessels are apparently obliterated, and the mucous membrane appears dark-red. The posterior border of the internal urethral orifice is swollen and the epithelial cells are edematous. Every case of apparently cured chronic posterior urethritis, if doubt exists, should be cystoscoped in order to recognize any latent bladder disease. If it is not possible to cure the condition by instillations, the entire granulating surface of the trigonum may be curetted.

Jesinnek⁴ states that poor results from the use of **protargol in gonorrhea** are due to changes in the solution. The powder should be dissolved in cold water and should always be freshly made. In ordinary

¹ N. Y. Med. Jour., Sept. 21, 1901.

² Med. News, July 13, 1901.

³ Chicago Med. Recorder, Feb. 15, 1902.

⁴ Münch. med. Woch., Nov. 5, 1901.

cases of urethritis a 0.5 % to 2 % solution is employed, but for cervical gonorrhea the solution should be as strong as 10 %. In treating posterior urethritis a 0.5 % to 2 % solution may be injected in large quantities or a 10 % cocoa-butter ointment may be topically applied. He tabulates the results of 387 cases treated. The gonococci disappeared between the second day and the fourth week. Of 287 cases which were discharged cured, 140 showed no cocci after the third day. It is advisable, however, to continue the injections at least 3 weeks. Glycerin should not be added to the solution, as it acts as an irritant and does not produce any benefit.

H. de Brun¹ lauds **picric acid for the treatment of gonorrhea**. In the strength of 1:200 the injections are painless; they should be retained for 3 minutes. When given 2 or 3 times a day, the discharge ceases in from 4 to 5 days. Chronic cases are also amenable to cure.

E. Jacobi² writes on **crurin in gonorrhea**. Crurin, thus named because of its effects on leg ulcers, is a rhodanate of chinolin and bismuth with the following formula: $(C_6H_5NHSCN)_2Bi(SEN)_3$. The rhodanates act as germicides, while the bismuth acts as an astringent. A solution is prepared by mixing 15 gr. of crurin with a little over a dram each of water and glycerin; more water is gradually added until the resulting mixture equals about 7 ounces. About 2 drams of this crurin solution is injected into the urethra 2 or 3 times a day. Jacobi is convinced of the efficacy of this drug as a remedy for gonorrhea.

H. M. Christian³ publishes a study of 6587 cases of genitourinary diseases, of which there were 1240 cases of gonorrhea, 449 cases of chronic anterior urethritis, 253 of chronic posterior urethritis, 420 of stricture, 452 of chancroid, 440 of chancre, 479 of secondary syphilis, and 157 of tertiary syphilis. Although the modern **treatment of gonorrhea** renders the patient much more comfortable than formerly, the duration is quite as protracted as it was 10 years ago. Christian treats gonorrhea as follows: During the first 10 days or 2 weeks the patient is given 2 solutions for injection. The first, which is composed of permanganate of potassium, $\frac{1}{2}$ gr. in 8 ounces of water, is injected into the urethra 3 times during the day, 6 syringefuls being used. This is followed by a solution of protargol, 10 gr. to 4 ounces, which is injected into the urethra and retained 10 minutes. At the end of 4 days the strength of the permanganate is increased to 1:4000, and the protargol to 20 gr. in 4 ounces. During the third week a favorite preparation is zinc sulfate, 10 gr.; bismuth subcarbonate, 2 drams; solution of hydrastis (colorless), $\frac{1}{2}$ ounce; water, 4 ounces. Copaiba and oil of sandalwood are always given internally. Under this treatment the majority of acute cases recover in from 6 to 7 weeks. Chronic urethritis depending upon stricture or granular patches in the urethra is treated by the passage of sounds 3 times a week, followed by an irrigation of silver nitrate, beginning with a solution of 1:8000 and gradually increasing to 1:1000. In cases of chronic folliculitis involving the glands along the urethra, a

¹ Ann. de dermat. et de syph., Sept., 1901. ² Deut. med. Woch., Dec. 26, 1901.

³ Therap. Gaz., Nov. 15, 1901.

sound covered with an iodine and iodide of potassium ointment is introduced. Chronic posterior urethritis is treated by massage of the prostate and irrigations of the urethra, and deep instillations of protargol, copper sulfate 3 %, and silver nitrate 2 %, are also useful in these cases. Chancroids are cauterized with nitric acid, the patient afterward using a dusting-powder of iodoform (2 parts) and acetanilid (1 part). Powdered chloretone is useful when there is much pain. Chancres are washed with a 50 % solution of hydrogen dioxide twice daily and dusted with a powder containing acetanilid and iodine in equal parts. Constitutional treatment is not begun until after the appearance of the secondary symptoms. Mild cases are given $\frac{1}{4}$ grain of mercury protoiodide 3 to 4 times a day for 18 months. In severe cases increasing doses are given until there are signs of mercurialism, when the dose is divided by 2 and continued. Inunctions are given when the mercury by mouth is not assimilated. In tertiary syphilis mercury is always combined with potassium iodide.

V. G. Veeki¹ calls attention to the **harmfulness of the urethral syringe** in contributing to the various gonorrheal complications because it is rarely cleansed and never disinfected, thus causing a reinfection as well as autoinfection of the urethra. He suggests the use of a hard-rubber syringe with a detachable soft-rubber tip which can be disinfected by boiling.

A. G. Auld² publishes 3 cases of **profuse hemorrhage occurring in the course of an attack of gonorrhea**. The bleeding is best checked by astringents applied to the diseased area by means of the urethroscope.

H. M. Christian³ says the time-honored custom of designating as **gleet** all chronic urethral discharges is a popular error. He gives the following points for distinguishing these discharges: In gleet there is a history of chronic anterior or posterior urethritis, epididymitis, or prostatitis; the discharge is yellow or yellowish-gray, forms a crust gluing the lips of the meatus together in the morning, and distinctly staining the linen; microscopically it contains pus, epithelium, fibrous shreds, and occasionally gonococci; sexual intercourse or the use of alcohol increases the discharge; the urine is clear or cloudy and contains clap shreds and pus. In prostaticorrhea there is a history of sexual abuse or masturbation; the discharge is milk-white, appearing during sleep, on exertion, or at stool; it does not glue the lips of the meatus together, and stains the linen slightly; microscopically there are amyloid corpuscles but no pus; alcohol and sexual intercourse have no effect on the discharge; the urine is clear and contains small comma-shaped hooks. In urethrorrhea there is a history of stripping the penis during the course of a chronic gonorrhea; there is an excess of moisture at the meatus, which contains no pus, which is uninfluenced by alcohol or sexual intercourse, and which contributes no pathologic features to the urine.

A. Ravogli⁴ **defines gleet** as that period of chronic inflammatory

¹ Pacific Med. Jour., Aug., 1901.

² Lancet, May 31, 1902.

³ Am. Jour. Med. Sci., Mar., 1902.

⁴ N. Y. Med. Jour., Jan. 4, 1902.

changes in the urethra which begins with the cessation of gonorrheal symptoms and ends with the formation of a stricture. The cause is the infiltration and inelasticity of the tissues and glands of the urethra limited to circumscribed patches which prevent the perfect voiding of the urine. The urethra is not a simple tube for the passage of urine, but a muscular organ which normally squeezes out every drop of urine from its canal. When a part of the mucosa is rendered hard and inelastic from hypertrophy of its histologic elements, this place will be a hindrance to the muscular layers in the attempt to extrude all the urine. In consequence a small quantity remains about the infiltrated area which is sufficient to explain the obstinacy of the chronic inflammation. In most of the cases gonococci are not to be found. By careful treatment many of the cases may be cured, but in a few only marked improvement results. Strict abstinence from alcohol and venery should be maintained. Salol and urotropin are among the best urinary antiseptics. Bromids and opiates are of great service for sexual excitability and neurasthenic conditions. Often tonics must be ordered. The time of the clap syringe is over; injections made by these means do not reach the posterior urethra, and therefore are of no benefit. By lavage the posterior urethra is washed with some force and the surface and glands are in consequence cleansed. By lavage without a catheter (Janet) the fluid is placed in a percolator at a height of from 4 to 5 feet above the canal. The tube of the irrigator is applied to the meatus and the anterior urethra is readily filled and distended by the fluid, which, forcing the cut-off muscle, penetrates the posterior urethra and enters the bladder. When a certain quantity enters the bladder, the patient urinates, and the medicated fluid passes a second time over the diseased mucous membrane. For a recent anterior urethritis, lavage by the method of Janet is very beneficial, but for a chronic posterior urethritis irrigation through a recurrent catheter is much more desirable. Ravogli has devised a catheter which washes the posterior urethra thoroughly without distending the bladder. He uses potassium permanganate 1:5000, the irrigation being continued for 5 minutes. The permanganate is a good disinfectant, and coagulates mucus and pus, which are removed as brown shreds. When infiltration of the submucous layers has already begun, lavage will not bring about recovery. In these cases it is a common practice to instill 2 or 3 drops of a 2 % or 5 % solution of silver nitrate, allowing the patient to urinate immediately afterward in order to neutralize any excess of solution. The author has abandoned the instillation of silver nitrate, using instead a 2 % or 3 % solution of silver protein, which is safer than the former and less painful. When it is desirable to treat a localized area of urethra with silver nitrate, the urethroscope should be employed, with which the cauterization may be limited. A 3 % to 5 % solution of copper sulfate or of trichloroacetic acid may be employed through the urethroscope. When deep infiltrations are present, although we may heal the erosions by means of the endoscope, the thickening remains and progresses on to the formation of a stricture. In order to produce absorption of the infiltration,

sounds should be passed to produce pressure. The sounds should be introduced once a week, their caliber should be gradually increased, and they should be left in the urethra for 5 minutes. The writer uses special sounds which are covered with rubber except at the tip. The metallic tip is placed within the infiltrated area and a current of from 12 to 20 milliamperes is sent through the sound, the patient holding the sponges attached to the positive pole in his hand. When the sound is removed, a quantity of milky fluid oozes from the meatus. The application is not painful, but there remains a little irritation for several days. The gleet discharge is at first increased, and then subsides for some days. After anesthetization with a 2 % solution of cocain, dilators may be employed. The instrument is introduced into the urethra in the same way as the ordinary sound, and when it is brought into position, the branches are separated by turning a screw and dilation begins. When the patient notices a slight sensation of tension, the dilation should be stopped until the sensation passes away, when it may be begun again and continued until the sensation returns. The instrument is allowed to remain in position for a few minutes and the degree of dilation is noted as a guide for successive sittings. The dilations are repeated at intervals of 1 or 2 weeks in order to give time for the healing of the numerous fissures which are produced by the stretching. In the mean time the patient continues the injections of permanganate.

Battez¹ has collected 30 cases of **gonorrheal pelvic peritonitis** occurring in the male. Only 2 of the cases followed a simple urethritis. It usually follows a gonorrheal inflammation of the bladder, prostate, or more especially of the seminal tract—epididymis, vas, and seminal vesicles. The peritoneal inflammation may be due to contiguity, as it is difficult to find the gonococcus in the inflamed peritoneum. The condition is short in duration and relatively benign; 4 cases of death from generalized infection are recorded. The symptoms are pain in the iliac region, vomiting, constipation, fever, and the characteristic general signs of peritonitis. Subacute cases may have few general symptoms and slight local tenderness on rectal examination. Many of these cases are overlooked, and others are mistaken for appendicitis, intestinal obstruction, or perforative peritonitis. The treatment consists in the application of leeches and ice locally and the internal administration of opium.

Frederick Bierhoff² writes on the rôle of **the prostate gland in gonorrhea**. Gonorrhea extends to the posterior urethra in one-sixth of the cases (Leprevost), in 80 % (Eraud), in 87.7 % (Jadassohn), 92.5 % (Letzel), 62 % (Rona), 93 % (Dind), 59 % (Ingria), 86.6 % (Phillipson), 33.5 % (Finger), and in 32.5 % according to Frank. Of 151 cases of posterior urethritis observed by Bierhoff the prostate was involved in all. Finger states that a catarrhal glandular prostatitis is regularly a complication of acute posterior urethritis. Sigmund thinks every gonorrhea of several weeks' duration is followed by a swelling of the prostate. Montagnon and Eraud believe infection of the prostate is present in 70 % of the cases of posterior urethritis. Von Frisch says that probably

¹ Thèse de Lyon, 1901.

² Med. News, Dec. 28, 1901.

every case of posterior urethritis implicates the prostate. Goldberg thinks one-half to one-third of all gonorrheas affect the prostate. Pezzoli found the gland involved in 80 % of his cases; Columbini in 28 % of his acute and in 49 % of the subacute and chronic cases. Frank states that the largest number of chronic and latent gonorrheas are due to foci of infection in the prostate. The method of treatment seems to have little effect on the development of a prostatitis, although with the proper application of the newer remedies the percentage of cases which develop posterior urethritis and prostatitis will probably be much reduced. Any condition which produces congestion of the deep urethra or which forces the germs into the posterior portion of the canal favors implication of the prostate. Among these conditions are excesses in venery and alcohol, long marches, horseback-riding, bicycling, sedentary occupations, local irritants, forcible injections, catheterism, etc. A large percentage of males, whether they have suffered from gonorrhea or not, present catarrhal changes in the prostate. The foci of catarrhal changes form a *locus minoris resistentiæ* and offer the best site for the development of a gonorrheal process. These individuals usually have a history of masturbation or coitus interruptus. The extension of the gonorrheal inflammation from the anterior to the posterior urethra and prostate may occur in an acute form, with decided symptoms, or its onset may be so gradual as to present no physical symptoms. In the greater proportion of cases the onset is insidious and the first symptom is a turbidity of the last portion of the urine. Rectal examination reveals a large prostate with distinct areas of softening; palpation is not necessarily painful. Pressure on the softened areas causes the prostatic secretion to be expelled into the urethra, whence it usually passes to the meatus. The secretion is milky, watery, bloody, or purulent, and has the odor of semen. Prophylactic treatment consists in the attempt to cure the gonorrhea in the shortest possible time. Bierhoff uses irrigations of 0.5 % solution of protargol without the use of the catheter. If the prostatitis has already developed, the treatment consists in massage unless there are acute general symptoms. When fever is present, irrigations alone should be employed until its subsidence. Massage should always be accompanied by treatment of the entire urethra. For massage the finger is preferable to any instrument, as foci of disease may be appreciated, the amount of pressure can be better gaged, and there is less liability of injuring the patient. The rectal cooler or rectal psychrophore is an additional aid to treatment. General treatment is often indicated. When an aseptic mucous discharge continues, application of astringents with a course of dilation should be employed. In most cases the prognosis is good.

Martin W. Ware¹ reports a case of **gonorrheal myositis** occurring in a male aged 35. During the fourth week of an acute gonorrhea he developed an inflammation of the left knee. Later he complained of pain in the shoulder. On examination a tender induration about the size of a walnut was felt in the posterior axillary fold. As this mass continued to grow larger and more painful an incision was made to relieve

¹ Am. Jour. Med. Sci., July, 1901.

the tension. No pus was encountered, but a free oozing of turbid serum occurred; a piece of the muscle was excised. Relief of pain followed, but the induration increased in area until it involved the entire latissimus dorsi muscle. Cover-glass smears revealed typical gonococci. The muscle showed a connective-tissue proliferation so great as largely to increase the interval between the individual fibers and compress them; the muscle-fibers in part also gave a picture of cloudy swelling. There are recorded in literature 3 cases of gonorrheal myositis based on clinical observation. It is probable that a large number of cases of myositis reported in females, and classed as pyemia following the puerperium, rest on a basis of gonorrheal infection. The treatment is expectant. If the pain is excessive, incision will relieve tension and accomplish depletion. When the acuteness of the process has abated, massage will be of value.

Mracek¹ reports a case of **reinfection** of syphilis **8 years** after the first attack.

Federn² says that **syphilis** not only follows the indurated sore, but **may ensue on any ulceration** which has little or no discharge. A freely suppurating sore, especially if accompanied by suppurative bubo, is not a forerunner of syphilis. The soft and hard chancres are due to distinct organisms which may be simultaneously inoculated; the after-history of such cases may depend on the antagonism between these organisms. The writer suggests the inoculation of hard and scantily secreting chancres, with pus from freely suppurating soft sores to control syphilitic infection. As the virus of a soft sore extends to the gland much more rapidly than that of a hard chancre, the treatment would probably be much more successful than excision or cauterization.

DISEASES OF THE BRAIN AND NERVOUS SYSTEM.

E. W. Dwight and H. H. Germain³ discuss the question of **thrombosis of the cavernous sinus** and report 4 cases, in one of which relief of the condition by operation was attempted. In the case operated upon thrombosis of the cavernous sinus resulted from a cellulitis of the face having its origin in a small abscess near the nose. The condition was diagnosed, and Dwight exposed and opened the sinus, with immediate but temporary relief of the symptoms, the patient dying 6½ hours after operation. The authors conclude that it is impossible to decide what the mortality of cavernous sinus thrombosis in unoperated cases really is; certainly, if not always fatal, the condition is always serious, and fatal in a vast majority of the cases. Death usually results from septicemia or pyemia, and in well-established cases operation offers the only hope of recovery. Excision of the eyeball with curettage of the ophthalmic vein is insufficient, as is admitted by the advocates of the method. Operation upon the lateral sinus has been practised in a few cases to relieve thrombosis of the cavernous sinus, but usually it is ineffectual, and must be so if the thrombus is a primary one or

¹ Wien. klin. Woch., No. 9, 1901.

² Wien. med. Presse, Dec. 15, 1901.

³ Boston M. and S. Jour., May 1, 1902.

is well formed. Direct incision of the cavernous sinus has been performed but twice, once by the authors and once since by Hartley and Knapp. The operation has been recognized by several authors as the rational treatment, but has not been attempted on account of the grave difficulties and dangers which are believed to be associated with it. In Hartley's case, which was not an acute one, the patient withstood the operation and lived for several months, dying as the result of his original disease—sarcoma. In Dwight's case the operation, which only required 8 minutes, certainly did not render the patient's condition any more dangerous and rather tended to relieve it, although death ultimately occurred. Dwight's case shows that incision into one sinus instantly and completely relieved the interference with circulation in both. The hemorrhage following the opening of the sinus can be easily controlled with packing. These two operations would practically justify the belief that thrombosis of the cavernous sinus is distinctly an operable condition, and that operation holds out a reasonable hope that a decrease in the present mortality of this serious condition may be obtained.

Fletcher Gardner¹ reports a **cerebral abscess of the temporo-sphenoidal lobe** occurring in a patient 21 years of age who had suffered almost constantly with suppuration of the left middle ear since he was 4 weeks of age. On March 24th a Schwartze-Stäcke operation was done, and the patient's condition was greatly improved by it. With the subsidence of fever following the operation, paraphasia, affecting principally nouns, became noticeable. Besides the motor aphasia, the patient developed alexia and agraphia. There was no paralysis until just before a second operation was performed; there were no pressure symptoms until this time; there was a little pain in the eye, but there was no tenderness on pressure or percussion. By April 3d pressure symptoms had developed, the temperature and pulse were both falling, and epileptiform convulsions had begun. On this date the skull was trephined at a point 1½ inches behind and the same distance above the external auditory meatus. The dura was opened, a grooved director was introduced into the brain, and pus of an extremely foul odor was found at a depth of a half-inch. Drainage was established and the patient made a slow but satisfactory recovery. The symptoms presented by this patient indicate an involvement of centers quite wide apart. This is explained by the fact that from the temporal lobe a band of association fibers which have to do with speech proceeds to the frontal lobe; any lesion of these fibers causes paraphasia. A second band of fibers proceeds to the occipital lobe, and a lesion of this band causes alexia. The agraphia, total aphasia, and ptosis were probably the result of pressure.

D. B. Lees² reports 2 cases of **abscess of the temporosphenoidal lobe** in which there had been no history of middle-ear disease, and in which no evidence of inflammation of the tympanic cavity or mastoid cells was found at the necropsies. In each case the abscess apparently resulted from necrosis of the petrous bone. The mucous membrane under the bone was perfectly normal.

¹ Med. Rec., Aug. 3, 1901.

² Lancet, May 3, 1902.

A. E. Jones¹ reports an interesting case of **tumor situated in the left cerebral hemisphere** in which **rotation of the tongue** was present. Jones has been unable to find a case recorded in which rotation of the tongue occurred. Beevor and Horsley have shown that stimulation of a localized area of the cortex in the lower part of the ascending frontal convolution will produce rotation of the tongue to the same side.

Charles Phelps² presents an exhaustive study of 18 cases which illustrate the **localization of the mental faculties in the left prefrontal lobe**, and reaches the following conclusions: "(1) The more absolutely the lesion is limited to the left prefrontal lobe, the more positive and distinctive are the symptoms of mental defect. (2) The integrity of the mental faculties remains unimpaired in right frontal lesion, though it involves the destruction of the entire lobe, or even extends to the entire hemisphere. (3) The exceptional instances in which seemingly opposite conditions exist are always reconcilable, on more careful examination, with the assertion of an exclusive control of the mental faculties residing in the prefrontal region of the left side. If, then, the same nature and degree of proof which is deemed sufficient for the localization of other cerebral functions may be accepted in case of the mental faculties, their center of control has been established."

J. Lynn Thomas³ reports a **successful operation for an occipital meningocele** which was larger than the child's head. The patient was a male infant 4 months old. The tumor had existed since birth and had its attachment at the posterior fontanel. Its pedicle measured 3 inches in diameter. At the time of operation the circumference of the tumor was $2\frac{3}{4}$ inches greater than the largest circumference of the head. It had been tapped a number of times. The child was unable to move the head on account of the enormous size of the meningocele. The tumor was translucent and fluctuating. Chloroform was administered and skin-flaps were reflected from the pedicle, which was then clamped with strong occlusion forceps 6 inches long. The forceps was closed gradually while the meningocele was tapped. The pedicle was rendered water-tight by means of a Geley's suture and 2 rows of continuous sutures. The skin-flaps were approximated and a collodion dressing applied. The child made an uneventful recovery, and 6 weeks after the operation was much improved in general appearance, seemed more intellectual, and was able to move the head about. The bony boundaries of the opening in the occipital region were $3\frac{1}{2} \times 2\frac{1}{2}$ inches.

Wheeler⁴ reports a case of **hydrencephalocoele** which is of interest because of its great size. The child died on the twenty-fifth day after admission to the hospital, having steadily lost in weight and strength since birth. There were neither any symptoms of digestive disturbances nor any convulsions even when the tumor was compressed. The growth had its attachment through the posterior fontanel and was connected with the left lateral ventricle. The case is of interest because of the

¹ Lancet, Sept. 28, 1901.

² Lancet, Jan. 11, 1902.

³ Am. Jour. Med. Sci., April and May, 1902.

⁴ N. Y. Med. Jour., Feb. 1, 1902.

osteoporosis of the cranial bones and because the pedicle which connected it with the lateral ventricle entered the skull in the median line.

Edgar Du Cane¹ reports an **operation for a meningoencephalocele**. The infant was 3½ days old and the growth was about two-thirds the size of the child's head, globular in shape, and connected with the occipital region by a large circular pedicle. Four ounces of fluid were removed by aspiration and skin-flaps were dissected back. The tumor was found not only to consist of the membranes, but also to contain both occipital lobes. As these could not be returned to the cranial cavity, they were excised, the division taking place immediately behind the angular gyrus. All bleeding points were ligated and the skin was sutured over the stump. After the operation the child reacted well and presented no signs of paralysis and had no convulsion. The wound healed readily without suppuration. After 14 days of uninterrupted progress the child had a convulsion, and died 16½ days after the operation. The necropsy showed almost complete cicatrization of the cerebral lesion, but the brain was adherent to the membranes and the latter to the operation wound. There was no pus and no distention of the ventricles. Reference is made to the fact that Ferrier, Horsley, and others have shown that although the occipital lobes are included in the visual centers, it is nevertheless a remarkable fact that they can be injured or cut off bodily almost up to the parietooccipital fissure without the slightest impairment of vision.

Leszynsky and Glass² report an interesting case of **endothelioma involving the arm and leg centers in the cortex of the right hemisphere**. The patient presented none of the general symptoms of brain tumor—that is, headache, vomiting, or vertigo; nor was there any disturbance of speech or intellect. The diagnosis was made upon symptoms presented in the arm and leg. The duration of the trouble extended over 2 years. An osteoplastic flap was made and a tumor measuring ¾ of an inch in diameter was found in the situation indicated. The growth extended up to the longitudinal sinus and was attached to the falx. After the removal of the tumor the cavity was packed and the patient recovered. Considerable improvement followed the operation, the patient regaining his ability to walk and enjoying excellent health. Two years have elapsed since the operation, and the patient is following his occupation as an accountant, although a condition of partial hemiplegia is still present.

A case of **tumor of the prefrontal lobe** which was removed by operation is reported by Elder and Miles.³ There is still much to be learned about the localization of cerebral growths, and reference is made to the fact that only a small percentage of brain tumors are operable. The patient whose case is reported was a man 47 years of age who had good health until 5 months before admission to the hospital, when he began to suffer with headache, which later became definitely located in the prefrontal region on the left side. Occasional attacks of cerebral vomiting occurred. Notwithstanding these symptoms, the patient

¹ Lancet, May 24, 1902. ² Med. Rec., Sept. 28, 1901. ³ Lancet, Feb. 8, 1902.

was able to continue his work until one month before being admitted to the hospital, when he became depressed, would not take his food well, and frequently became emotional. Loss of memory developed later, all sense of decency disappeared, and he became oblivious to his surroundings. About the time of admission a swelling appeared over the left frontal eminence and great pain was complained of in this region. On admission he was dull, sleepy, and apathetic, but could be roused to answer questions; no aphasia was present, but there was some paresis on the right side; he could walk easily and there seemed to be no want of coordination. At this time there was no severe pain in the head, but percussion over the left frontal region produced pain; the swelling over the frontal region presented a soft center and seemed to involve the bone. Over the right frontal region was a small depressed cicatrix, the result of an old abscess. The patient denied having had syphilis. His wife had had three miscarriages, at 6, 7, and 8 months respectively, and had given birth to 4 living children. No history could be obtained of any injury to the left side of the head, although 4 years previous to the occurrence of the abscess on the right side of the head he had received a blow in that region. On entering the hospital he was put upon potassium iodid and mercury, but grew rapidly worse, becoming much more stupid and developing stertorous respiration. Operation was determined upon, and was performed by Miles on the third day. The skull in the left frontal region was found superficially necrosed over a small area; the under-surface of the bone was smooth and the dura was not adherent, although it bulged into the trephine opening. Exploration of the frontal lobe revealed a hard tumor, $2 \times 1\frac{1}{2} \times 1\frac{1}{2}$ inches, which was removed; an examination of this growth showed it to be a syphiloma. The operation was followed by a rapid disappearance of the symptoms of dulness and depression; and for these, in fact, was temporarily substituted a tendency to witticism and hilarity. The report closes with an interesting discussion of the symptoms presented by the patient.

James Stewart¹ reports a case of **subcortical glioma of the lower part of the left ascending frontal convolution** which was **successfully operated upon** by James Bell. The history of the case is summarized as follows: "A man, aged 37, without previous warnings, suddenly became speechless for about 20 minutes. There was a recurrence of attacks of a similar character every few days for a period of several weeks. Then severe headache and optic neuritis supervened, and afterward facial spasm, followed by paresis of the lower facial muscles on the right side, as well as weakness of the right half of the tongue. The mutism was no longer noticed, its place being taken by a dysarthria, first of labials and later of all letters and words, and finally passing on to a practically complete anarthria. On opening the brain a tumor was found immediately beneath the gray matter of the lower part of the ascending frontal convolution. The removal of this was easily accomplished, and was followed in the course of a few days by disap-

¹ Amer. Med., Dec. 21, 1901.

pearance of the anarthria and the faciolingual paralysis. The patient is now, 2 months after the operation, practically well, there being no evidence, except slowness of speech, of any disturbance of the central nervous system."

G. A. Syme¹ reports a case of **tumor of the cerebellum** which pressed upon the medulla and produced death from interference with the respiration during operation. The case resembles another reported by Syme's house surgeon² a short time before. The cases are similar in many respects: in both there was a history of injury in the region of the petrous bone with bleeding from the left ear; and in both the tumor developed upon the injured side. Staggering gait was a marked symptom in both patients, serving to localize the lesion in the cerebellum, and in both pressure on the medulla interfering with respiration caused death when operative interference was attempted. Both of these cases show the danger of exploratory operations for lesions in this region. Nevertheless, the operation is justifiable, since without it death is inevitable. It is important, however, to explain the risks of the operation, which are greater than in ordinary exploratory trephining. In the first case, death occurred before Syme was able to open the skull. In the second case respiration failed at the mere introduction of the finger to ascertain the position and limits of the growth. In this case the tumor was a fairly hard, rounded one, about $1\frac{1}{2}$ inches in diameter, situated in the left lobe of the cerebellum, and was easily detached from the cerebellum and dura. Erosion of a portion of the petrous bone had taken place from pressure. The growth lay in a groove formed by the left lobe of the cerebellum and the pons and medulla.

Piollet,³ after reporting two cases of **cerebellar operations**, under the care of Jaboulay, and appending a table of 48 other records of tumor or tuberculous growths of the cerebellum removed by trephining, reaches the conclusion that surgical interference in such cases is very unsatisfactory. One of the two cases reported was that of tuberculous deposit in the right lobe not treated by operation; and the other was a glioma of the left lobe removed by trephining, followed by marked and persistent improvement. Death was the immediate result of the operation in not less than 20 of the combined 50 cases. Improvement was noted in 16 cases, but in many of these was followed by a recurrence of the more severe symptoms, and in others by an early death. Only 4 cases are reported in which an almost complete cure took place, and only 1 case in which a rapid and presumably complete cure was the result.

An interesting case of **gunshot wound of the brain in which alexia was the principal localizing symptom** is reported by G. W. McCaskey.⁴ The patient was a woman 31 years of age. The bullet entered the skull $4\frac{1}{2}$ inches to the left of the sagittal suture and $\frac{1}{2}$ inch in front of the binauricular line, the wound being received 7 years before the patient

¹ Intercol. Med. Jour. of Australasia, Dec. 20, 1901.

² Intercol. Med. Jour. of Australasia, Oct., 1901.

³ Arch. Provinc. de Chir., No. 12, 1901. ⁴ Jour. Am. Med. Assoc., Feb. 8, 1902.

came under the care of McCaskey. The patient was unconscious and delirious for 4 weeks after the injury, and for 2 months was confined to bed; after getting out of bed she was unable to walk for 4 months. She partly regained the use of her leg, however. Since the injury she has had more or less speech disturbance, and a few months before coming under McCaskey's care she developed an abscess of the right ear which was relieved by a spontaneous discharge of pus. All the symptoms began recently to grow worse, the patient suffering from severe headaches, marked increase of speech disturbance, and some increase of paretic weakness on the right side. It was found upon examination that she could walk, although limping badly; the right foot was much weaker than the left, the right knee-jerk was grossly exaggerated, as were also the elbow and jaw-jerks; sensation over the right side was impaired; vision was normal in both eyes. The patient showed some signs of slow cerebration, and the disturbance of speech was most interesting. There was also a certain degree of partial agraphia; alexia was marked. A diagnosis of destructive lesion of the angular gyrus was made, and the condition was thought to be either a cyst or an abscess. Upon operation the bullet was found with a small spiculum of bone attached to it at the point indicated. A cyst about $1\frac{1}{4}$ inches in diameter was evacuated and the cavity drained, but the patient died subsequently of what was supposed to be hemorrhage.

A case of brain tumor in which the symptoms were obscured by peripheral neuritis is reported by McCaskey and Porter.¹ The patient was a farmer 34 years of age who complained of heart trouble and general nervousness. Following an attack of typhoid fever 10 years previously the patient had always suffered more or less from indigestion, and 2 years after the attack developed a pain of an inconstant character in the calf of the left leg. When McCaskey first saw the patient, in September, 1900, there was evidence of chronic gastroenteritis. In the left leg was found partial anesthesia, motor weakness, and electric reactions of degeneration. In the right leg these conditions were present, but much less marked. This peripheral neuritis was supposed to be due to toxemia resulting from gastrointestinal disease. A doubt was cast upon the peripheral nature of the neuritis by the fact that there was motor weakness of the left upper extremity without sensory or electric disturbances. There later developed a paretic weakness of the left side of the face, which proved that the patient's trouble was central, and that a progressive lesion of the right motor area of the brain was taking place. Although vision was practically normal, there was beginning optic neuritis in the right eye, which later became more marked and also appeared in the left eye. Porter operated on February 6, 1901, exposing the motor area; no tumor was discovered when the skull was opened, but the electrodes applied over the leg center produced absolutely no response; the arm center, however, responded to electric stimulation. There was markedly increased intracranial pressure, as shown by the bulging of the brain when the bone-flap was re-

¹ Jour. Am. Med. Assoc., Jan. 25, 1902.

moved. A tumor about the size of a pullet's egg was found and removed from beneath the leg center; it was inclosed in a capsule which was easily separated from the brain-tissue. A profuse hemorrhage occurred during the removal of the tumor, but this was controlled by packing. The bone was not replaced. At the end of 48 hours the packing was removed and a wick of gauze substituted for drainage. This was removed in a few days and the wound healed without suppuration. The patient was relieved at once of the pain in the head of which he had complained prior to operation. There was absolute paralysis of the right arm and leg following operation, but in about 8 weeks the patient was able to walk out of the hospital. The arm had improved very slowly. The patient's family physician reported in November, 1901, that there was some return of the pain in the head and also some mental symptoms which would indicate a return of the growth. A later report, however, about the last of December, said that the pain and mental symptoms had entirely disappeared, and the patient gave every evidence of making an entire recovery. The histologic diagnosis was glioma.

W. W. Keen¹ reports 2 interesting operations for **traumatic epilepsy**. The first case was that of a boy 19 years of age who was thrown from a horse in 1892, receiving a compound fracture of the skull. A portion of the bone was removed and one year later a piece of necrosed bone was discharged. Following the accident the patient is said to have been unconscious for 9 days. In 1899 the patient suffered from his first epileptic convulsion, since when he had had repeated recurrences. The convulsions did not begin in any one part of the body, but were universal. The examination of the eyes was negative. Because the development of the epilepsy was recent, and because at the time of the injury only a small portion of bone had been removed, operation was decided upon and was performed on April 17, 1901. At the seat of injury two openings in the skull were found, and the bridge of bone connecting the two was cut away and the dura freely exposed. Beneath the dura a thin, dark-colored sac, apparently the wall of a cyst, was met with. On opening this a considerable amount of fluid escaped. The cavity from which the fluid came measured 10 cm. in depth. The opening into the supposed cyst was enlarged, and Keen found that he had opened widely the lateral ventricle, the fornix, the choroid plexus, etc., all being in full view. The operator was in considerable doubt as to the best means by which to treat the wound, but finally determined upon temporary drainage. The gauze was removed the next day, when a large quantity of bloody fluid spurted from the wound, at least 4 to 6 ounces being lost. The escape of this fluid produced no symptoms whatever; pressure was applied to prevent the flow of more cerebrospinal fluid. On the sixth day 2 or 3 ounces of cerebrospinal fluid were evacuated, being at this time clear. The wound healed primarily and the patient made a good recovery. On May 8th the patient had 3 severe epileptic attacks. He left the hospital on May 10th and had no later epileptic attacks up to May 24th.

¹ Am. Jour. Med. Sci., July, 1901.

Although Keen has repeatedly punctured and frequently opened the lateral ventricle on each side, irrigated the brain through and through and drained the ventricles for a short time, this is the first time he has ever laid the lateral ventricle wide open. He was surprised to see what little effect the loss of so large an amount of cerebrospinal fluid had upon the patient. He is at a loss to find a cause for the unusual condition met in this case. There was absolutely no cortex and no white substance between the posterior half of the lateral ventricle and the membranes. The condition may have been one of acquired porencephaly, or one of simple destruction of cerebral tissue between the ventricle and the dura at the time of the excision, or by absorption later. The patient had at no time any palsy, and in spite of the extensive and deep destruction of brain-tissue there was no hemianopsia. The second case is one of a soldier 21 years of age. In February, 1900, he was struck in the head by a ball from a Krag-Jørgensen rifle. The ball passed completely through the head from side to side, and must have passed directly through or immediately below the superior longitudinal sinus. After the accident the patient remained unconscious for several weeks, at the end of which time epilepsy began. The patient did not lose consciousness during the attacks, which were confined to the left side of the body, including the face. In March, 1900, an operation was performed and a portion of bone removed. Later a second operation was done and a piece of bone inserted to close the opening. In November, 1900, the patient was much improved and able to walk, although the left side of the body was very weak. At this time, however, the epileptic attacks became more frequent. These were accompanied by intense pain in the left leg and arm. On January 16, 1901, a third operation was performed, the plate of bone which was inserted at the second operation being removed. Since this operation only one epileptic attack had occurred, although he had had repeated threatenings. When the patient came under the author's care, he was suffering from great pain in the back of his head and from paralysis of the left side. His general condition was only fair, his appetite poor, and the bowels constipated. He was unable to walk, but mentally was in fairly good condition. After admission he became more and more somnolent, his headache increased, and epileptic attacks became more severe. Suspecting an abscess, Keen determined to operate, which he did on March 30th. When the dura was exposed, it bulged very distinctly through the opening in the skull, and a hard mass, about the size of the last joint of the finger, could be felt through the dura. The dura was opened, a quantity of pus was evacuated, and a piece of bone measuring 2.5 cm. was removed with some difficulty. An examination of this bone showed that it had evidently been driven into the brain at the time of the accident in February, 1900, and had remained embedded in the brain for nearly 14 months. The distance from the surface of the brain to the bottom of the abscess was 7 cm. Drainage was established and the patient made a satisfactory recovery. Four days after the operation he could move his left leg, and about the same time power returned in the left

arm. The twenty-first day after the operation he was out of bed and could walk quite well. At the time of his discharge, on May 8th, his general health was perfect, except for an occasional moderate headache. For several days after the operation he was almost entirely unconscious.

Alfred W. Sanders¹ reports an interesting case of **gunshot wound of the head with a resulting cerebral abscess, accompanied by bilateral loss of peripheral vision.** Sanders saw the patient 10 days after the injury. At this time there was evidence of suppuration, and the wound was explored. The external wound was $1\frac{1}{2}$ inches from the median line and $2\frac{1}{2}$ inches above the external occipital protuberance. When this was explored, pus was found deep down in the cerebral tissue. Drainage was introduced and the patient recovered, but the partial blindness, which came on soon after the injury, still persisted. The case is of interest because of the extensive impairment of vision produced by an apparently unilateral injury. Several months after the injury no improvement in vision had taken place; the patient could spell out letters on a card, but was unable to read. There was no evidence of "mind blindness." Sanders thinks the case shows that in man both sides of both retinas are represented to some extent on one side of the brain.

The **operative treatment of traumatic intracranial lesions** is described by Charles Phelps.² The propriety of elevating depressed bone when no symptoms of intracranial injury are discernible, although not generally admitted, is accepted by a continually increasing number of surgeons. The author not only advocates this, but states that even a rational suspicion of the existence of a simple fracture, as in the case of hematoma with a history of considerable violence inflicted upon the head, with or without concurrent symptoms of intracranial lesion, demands exploratory incision. The matter of infection is within the control of the surgeon and the amount of shock or hemorrhage is inappreciable. Phelps has followed this plan of treatment for 10 years, and in those cases in which incision was proved unnecessary the wounds invariably healed primarily. If bony depressions, even though confined to the outer table, or a puncture or a large comminuted or fissured fracture is revealed, conjoined exploration and treatment should be instituted. The so-called conservative policy of inaction in cases where intracranial injury or bony depression is suspected has resulted in the development of dural or cortical abscesses, cerebral necrosis, epileptic convulsions, and multiform disturbances of functional control. If upon exploratory incision a fissured fracture is found which is firm and closed, the probability of a more extensive concealed osseous lesion is insufficient to warrant further intervention in the absence of intracranial complications. If such symptoms, however, accompany a fissure, trephining is indicated at the seat of injury, although it is probable that the symptoms are independent of the osseous wound. Trephining is indicated in such a case not only because of possible error, but also

¹ *Lancet*, Aug. 31, 1901.

² *N. Y. Med. Jour.*, Jan. 11, 1902.

because it will afford the best chance of reaching and relieving an intracranial complication. It is much more difficult to formulate general rules of procedure for the treatment of intracranial injuries than for the treatment of cranial fractures. Phelps advocates the classification of intracranial lesions in accordance with the structural damage rather than according to their symptoms. He therefore divides primary traumatic intracranial lesions into hemorrhages, contusions, and brain lacerations. Hemorrhages are subdivided into supradural or epidural, pial, and cortical; contusions are subdivided into meningeal and cerebral. When the symptoms presented in any case bring up the question of operation, the possible lesions may be considered from a practical point of view as divisible into two classes—supradural and subdural. Supradural hemorrhage is a condition usually easily diagnosticated and offering the best results from operative interference; it is the form of hemorrhage in which, with or without primary unconsciousness, an interval of consciousness most frequently precedes its later loss. The Hutchinson pupil is pathognomonic of supradural hemorrhage in the middle basic fossa of the same side, and can be distinguished from a dilation of the pupil due to cerebral contusion by the absence of other symptoms characteristic of that lesion. Local paralysis will point to the opposite parietal region, or respiratory derangements to the posterior fossa. The existence of a contused wound or hematoma will often be the obvious indication of the side of the deep-seated injury, since this (supradural hemorrhage) is the only intracranial lesion which is likely to be direct rather than to result from *contrecoup*. Phelps states that the reasonable certainty that an accessible supradural hemorrhage has occurred is insufficient to justify operation. The extravasations may not seriously inhibit the cerebral functions and absorption may take place. An insuperable bar to operation in a large proportion of cases is the concurrence of still more serious lesions in the brain itself. "It is only when symptoms point clearly to hemorrhage as the essential if not exclusive lesion that operation for its relief will afford legitimate hope of success." In each of these cases, however, the decision as to operation must rest solely upon the discretion of the surgeon, it being impossible to lay down formal rules in such cases. Except in cases in which the reaction after the hemorrhage fails or the pressure symptoms progressively increase operation should not be undertaken until the patient has recovered from the primary shock. "The resort to operation in other forms of intracranial lesion than supradural hemorrhage is of very limited utility." The pial or cortical hemorrhage, if it occurs in recognizable degree, will be widely diffused, and so entangled in the meshes of the pia that usually little can escape or be withdrawn through the cranial opening. Pial hemorrhage or serous effusion, the result of meningeal contusion, will probably be associated with a like condition of the entire brain-substance, the cortical hemorrhage being not more than an incident of the laceration from which it is derived. No advantage can be derived from operation when the urgent symptoms are the result of a general cerebral contusion.

Thomas W. Jackson¹ reports a case of **traumatic meningitis with effusion which was twice submitted to trephining with ultimate recovery**. Seven days after receiving a scalp wound which was so slight as not to require sutures, but which produced persistent headache, the patient fell while at work and lost consciousness. Later, upon his admission to the hospital, he was stupid, with full, slow pulse, and pupils practically normal. No palsy was present. He remained in a somnolent condition for 36 hours, his only complaint being that of headache. Two days later he had a convulsion, general in character, and followed by prolonged unconsciousness. This seizure was succeeded by other attacks of great severity. At this time the operation was decided upon, and in the absence of any localizing symptoms his skull was trephined at the site of the former wound in the left frontal region. The bone and dura appeared normal, but when the latter was incised more than 15 cc. of clear fluid escaped. Drainage was established and the patient reacted promptly without shock. No convulsions occurred for a number of hours, but the next day they returned with great severity. At this time it was observed that the convulsive movements began in the muscles of the left limbs, and that occasionally the onset was preceded by the rotation of the body to the left side. A second operation was determined upon, and was performed the day after the first operation, the trephine being applied to the right occipitoparietal region at a point obliquely opposite the first operation. At this time the convulsions were occurring at frequent intervals, and one took place during the progress of the operation. The dura was found very dark and bulging; there was no adhesion between it and the skull. When the dura was opened, there was a gush of brain fluid containing a number of small dark blood-clots. The pia was intensely red and injected. Drainage with gauze strips was established and the wound closed, except at the drainage opening. The relief from symptoms was immediate and complete, no general convulsion following the second operation, although several attacks of twitching of the left facial muscles and left hand took place on the second, third, and fourth days after the operation. The patient made a complete recovery and returned to his occupation of teamster.

D. S. Lamb,² of the Army Medical Museum, presents a case where **a portion of the skull had been lodged in the brain for 44 years**. The bone measured $1\frac{1}{2}$ inches by $\frac{5}{8}$ of an inch. It was removed postmortem from the right fissure of Sylvius adjacent to the first temporal, ascending parietal, and supramarginal gyri. The temporal gyrus was somewhat atrophied. The spicule was embedded in the pial vessels and appeared to be vascular. Minute pieces of lead were adherent to it. The patient at his death was 61 years of age. He had been accidentally shot 44 years previously. The ball was probed for and was not found. The patient made a prompt and complete recovery after the injury, developing no subsequent trouble.

¹ Phila. Med. Jour., May 3, 1902.

² N. Y. Med. Jour., Aug. 3, 1901.

W. B. Cannon,¹ at the suggestion of William Bullard, has carried out a number of experiments with the object of attempting to prove the fact of the increase of brain pressure after trauma and to determine the cause of such increase. His experiments show that at the moment of injury the intracranial pressure rises to a height sufficient to check the blood flow into the brain. Immediately after the injury the general blood-pressure usually rises for a moment, then falls. Later there is established a normal blood-pressure with the simultaneous increase in the extent of the pulsation of the brain. After a discussion of his experiments Cannon states that "the mischief arises because the brain is surrounded by a rigid case. Swelling of a part consequently compresses the only compressible portion of the cranial contents—the blood-vessels. Thereby new areas are shut out from normal blood-supply, and changes now take place in these tissues as well, with the result that water passes into them; thus the swelling spreads until the blood-flow is so greatly excluded from the brain that life is no longer possible. It is thus, I believe, that the cases of head injury resulting in death from secondary increase of brain pressure would be explained. Injuries to the brain interfere with its proper blood-supply. Such interference causes an increased osmotic pressure within the tissues, and a consequent taking up of water from the surrounding plasma. The swelling and edema of the brain after head injuries, therefore, are not due to passive transudation, as Bergmann and others have maintained, but are the result of an active process in the tissues themselves, a force many times greater than blood-pressure, and amply sufficient to produce all the pressure symptoms and account for all the signs of intracranial tension which the clinical cases of cerebral trauma often manifest."

Tuffier² reports 3 cases in which **lumbar puncture was an aid to diagnosis in cases of head injury**. These cases suggest that lumbar puncture in cases of head injury presenting diagnostic difficulties may help to reveal not only the existence of a subarachnoid effusion of blood, and consequently the presence of a cranial fracture, but may also afford some idea as to the quantity of this effusion, as well as to the extent of the lesions to which such effusion is due, the intensity of the coloration of the collected fluid bearing a relation to the degree of the meningeal hemorrhage. Since staining of the cerebrospinal fluid with blood takes place slowly, lumbar puncture should not be practised in the early stages. Lumbar puncture, together with the bacteriologic examination of the fluid obtained, is not only of value from a diagnostic point of view, but will also be of value in prognosis; it may prove of value also from a therapeutic point of view by relieving pressure.

Deanesly³ reports 3 cases in which he practised **basal drainage of the arachnoid for the relief of intracranial pressure**. Accumulation of cerebrospinal fluid in the ventricles is probably due to the blocking of the foramen of Magendie in the roof of the fourth ventricle, the result of tuberculous meningitis or pressure from a tumor or abscess

¹ Boston M. and S. Jour., Aug. 8, 1901.

² Bull. et Mém. de la Soc. de Chir., No. 27, 1901.

³ Lancet, Nov. 23, 1901.

of the cerebellum. The exact nature of the obstruction in the cases reported is uncertain, but each presented some or all of the symptoms of increased cranial pressure, such as headache, vomiting, double optic neuritis, slow pulsation and respiration, and few or no localizing signs. It is claimed that in 2 cases the operation relieved dangerous symptoms and probably averted death; in the third case severe headache was relieved, although an increase in muscular weakness and a defect in speech resulted from the operation. The ultimate result in this third case cannot yet be predicted. The first patient was well and free from symptoms and at work 18 months after operation. In the second successful case, seen 2 months after operation, the patient was apparently in good health and free from all signs of illness except a slight but subsiding optic neuritis. The condition in this case was quite acute, the symptoms closely resembling those of an acute meningitis.

Hugh T. Patrick¹ deals with the subject of **traumatic neuroses**, stating that the diagnosis of the condition is not difficult and that the most important point is the exclusion of organic disease. A single examination frequently does not afford sufficient data upon which to base a diagnosis. Incorrect diagnoses are usually the results of failure to recognize: (1) that pain, tenderness, paresis or paralysis, hyperesthesia, anesthesia, incoordination, tremor, dizziness, tachycardia, syncopal attacks, vomiting, loss of weight even to emaciation, impaired speech, convulsions, and poor vision, are not necessarily indications of organic disease, no matter how continuous or how long continued the symptoms may be; or (2) that atrophy, reaction of degeneration, incontinence of urine or feces, retention of urine (generally), loss of deep reflexes, bedsores, Babinski's sign, ocular or facial paralysis, optic atrophy or neuritis, hemianopsia, glossy skin, rapid (5 or 6 per second) and uniform ankle clonus, impaired pupillary reaction, semierrection of penis, and anesthesia corresponding exactly to a peripheral nerve or spinal segment, indicate organic disease. In trying to elicit the presence or absence of organic disease, one of the best methods is the establishment of the line between normal and abnormal sensation. In nearly every organic case it is impossible to locate definitely where anesthesia ends and normal sensation begins, whereas in functional disease the distance between complete anesthesia or analgesia and normal sensation is frequently not more than $\frac{1}{8}$ or $\frac{1}{4}$ of an inch. In order to bring out these points the patient must be blindfolded and the greatest care taken in the examination of the sensation. In functional sensory disorders it is also shown that if the patient is re-examined after a short interval, the line of demarcation will not remain the same, and often the tender points will not be the same at the second as at the first examination. A traumatic neurosis is never completely and at once produced by an accident, but develops slowly. It is a product of evolution. There is great necessity for an early diagnosis, since so much will depend upon the way in which the patient is treated. Attention is also called to the bad effect upon these patients of litigation,

¹ Jour. Am. Med. Assoc., Dec. 14, 1901.

quack literature, and the advice and sympathy of friends. They "are to be protected from ignorant doctors, foolish friends, designing lawyers, and their susceptible selves." It is extremely important to divert the patient's attention from the constant thought of his injury, and to get him back at work and into a wholesome and cheerful frame of mind. A settlement out of court of a damage suit will result in a much more rapid return to health in these cases. Stress is laid upon the fact that the diagnosis should be made early and the treatment should be prophylactic.

F. Krause¹ reports the final result in 27 patients who had the **Gasserian ganglion removed for trigeminal neuralgia**. The neuralgia had lasted more than 20 years in several cases, but all were completely cured. The patients ranged between 30 and 70 years of age, the majority, however, being between 50 and 70. Six patients were operated upon in 1893. Of the 27 patients, 3 died, the death in one instance resulting from advancing chronic disease; another patient, a man past 70, with an irregular heart, and extensive atheroma of the vessels, died 6 days after operation from heart failure. The third fatal case was that of a woman of 72, in whom death resulted from an undiscoverable cause, the wound having healed normally. All of the patients had undergone resection of some portion of the nerve-trunk prior to the radical operation. An occasional itching and burning was the only sensation noted on the side upon which operation was performed. The duration of operation varied from 1½ hours to 3 hours, depending largely upon the amount of hemorrhage. Operation was declined in all cases in which the disease seemed to be of a functional or hysterical character.

Delangénère² reports 2 cases of **trifacial neuralgia** in which he practised **resection of the great cervical sympathetic** and resection and forcible stretching of the painful branches of the fifth nerve. The latter operation was done to give immediate relief, and the former with the idea that it might prevent a return of the trouble. In neither of the cases was the result satisfactory. Delangénère thinks, however, that these failures should not condemn the operation, but that it should be further studied and tried, as he believes that certain cases might derive much benefit from resection of the sympathetic.

Gavazzani³ reports 2 cases of **trifacial neuralgia** in which **resection of the superior cervical ganglion** resulted successfully. One patient had no return of the pain at the end of 17 months and the other was free at the end of 4 months.

Spiller and Frazier⁴ report a case of **division of the sensory root of the fifth nerve for neuralgia**. Spiller some years ago suggested the advisability of dividing the sensory root of the fifth nerve as a substitute for removal of the Gasserian ganglion. Following this suggestion, the question arose regarding the possible regeneration of the sensory

¹ Münch. med. Woch., July 9, 1901. ² Travaux de Neurol. Chir., June, 1901.

³ Travaux de Neurol. Chir., June, 1901.

⁴ Univ. of Penna. Med. Bull., Dec., 1901.

root. Spiller is unable to answer this question, but is rather inclined to believe that regeneration may take place. Following the suggestion of Spiller, Frazier practised division of the sensory root upon a patient 68 years of age. The man had suffered from neuralgia for 5 years, and during this time had undergone 4 peripheral operations. In dividing the sensory root the operator accidentally divided the motor root also. As a result of the operation there was an immediate and complete relief of pain. Insufficient time had elapsed at the time of the report for the operator to speak of the permanency of this relief. Frazier states that division of the sensory root is a simpler operation than that of removal of the ganglion. The technic of the first part of the operation is that of the Hartley-Krause operation. The sensory root after its exposure can be drawn out upon a hook and divided. Frazier recommends, however, that a small portion of the nerve be excised. The advantages of the operation over the removal of the ganglion are that the trophic function of the ganglion is not interfered with, and therefore there is no subsequent involvement of the cornea; and that the cavernous sinus and the sixth nerve are not endangered. [This ingenious operation commends itself as simpler and safer than removal of the ganglion. Only experience can tell us whether the relief is enduring.]

An interesting case is reported by Leo Newmark and Harry M. Sherman,¹ in which an **intracranial resection of the second and third branches of the fifth nerve** was done for the **cure of neuralgia**, and in which there subsequently developed a paralysis of the facial nerve. The patient was a man 59 years of age. The nerves were cut at their foramina of exit and were pulled from the ganglion, the third branch bringing a portion of the ganglion with it. The wound healed primarily. It is stated that at no time during the operation was any tissue handled roughly. The incision was well away from the usual position of the facial nerve. It is noteworthy that the integument in front of the ear did not show any abrasion or contusion after the operation. The authors are unable to explain why the facial nerve became paralyzed.

Schroeder and Green² discuss the question of **phrenic nerve injuries**, report a case, present the results of an anatomic and experimental research, and a critical review of the literature of the subject. The conclusions reached are as follows: "(1) From the clinical and experimental data it would seem that the diaphragm is not an essential muscle of respiration. (2) That as the symptoms commonly described as caused by an irritation of the phrenic were uniformly absent not only in the operation, but in all of the experimental work as well, it is safe to infer that they may have been due to something other than a simple injury to the phrenic. (3) That while from an anatomic point of view the diaphragm undoubtedly is innervated by branches from the intercostal nerves, this nerve-supply is secondary to the phrenic and is insufficient to carry on the action of the diaphragm after a division of the phrenic. (4) That a division of the phrenic nerve, producing a partial

¹ Jour. Am. Med. Assoc., Dec. 7, 1901.

² Am. Jour. Med. Sci., Feb., 1902.

collapse of the lower lobe of the lung on the affected side and an atrophy of one-half of the diaphragm, might predispose to infection of the lung or be followed by a diaphragmatic hernia. (5) That a division of one phrenic nerve in man, resulting in paralysis of one-half of the diaphragm only, is not necessarily fatal."

Geo. W. Crile¹ discusses the **effect of severing and mechanically irritating the vagi**. He first refers to the great variety of clinical reports relating to traumatism of the vagus and reviews the literature on the subject. Crile reports briefly 9 experiments conducted upon dogs with the object of determining the exact effect of severing and of mechanically irritating the vagi, and presents the following summary of the experimental evidence: "In the dog the sympathetic fibers run in a common trunk with the vagus proper. Therefore this nerve has been designated the vagosympathetic, so that allowance must be made for the sympathetic factor. Picking up the artery and nerve together and bringing them up in the wound, making an ordinary blunt dissection and separating these structures from their surrounding tissues, produced slight effect upon the circulation and respiration. On separating the nerve from the artery by means of blunt dissection, comparatively slight effects were noted. Grasping the nerve with the forceps produced, in most instances, a rise in the blood-pressure and a slowing of the respiration. Dragging down upon the nerve produced a marked effect. Picking up the nerve and rubbing it up and down, between the fingers, producing as much irritation as possible, caused a very distinct slowing of the respiration, and in most instances a rise in the blood-pressure. Occasionally, however, there was a temporary fall with a marked increase of the length of the heart strokes, indicating an inhibitory effect. In no instance was the heart completely inhibited. Grasping the nerve with two hemostatic forceps and so manipulating and irritating it, by sliding the forceps up and down, as finally to wear the nerve in two produced in most instances a rise in the blood-pressure, and usually a very decided slowing in the respiration. Not only was the respiration slowed, but the amplitude was diminished. It required some time before the normal rapidity and amplitude were regained. No amount of mechanical irritation, even to the extent of mechanically destroying the vagi, produced an arrest of the heart's action. Severing one vagus was attended by comparatively little effect upon either respiration or circulation. Usually there was a slight rise in the blood-pressure, and a slight decrease in the frequency of respiration, with an increase in the amplitude. The blood-pressure curve remained regular, and no particular effect upon the amplitude of the excursion of the manometer was noted. However, on severing both vagi the blood-pressure rose considerably, ran an uneven course, the frequency of the heart's action was much increased and the length of the stroke shortened. Respirations were greatly decreased in frequency, and the amplitude of the respiratory excursion was markedly increased, so that, as nearly as could be estimated, the loss occasioned by the respiratory action was

¹ Am. Jour. Med. Sci., April, 1902.

about counterbalanced by the increased amplitude of the excursion. The respiratory mechanism was much more affected than the circulatory and exhibited early signs of exhaustion." The foregoing findings are confirmed clinically to a large extent in the report of 6 cases. In the first case the right vagus was excised, together with all the venous and arterial trunks on that side, in an operation for malignant disease. Except an increase in the pulse-rate of 4 beats a minute, no other effect occurred as a result of severing the nerve. The respiration was not affected in the least. A hypodermic injection of $\frac{1}{100}$ of a grain of atropin had been given previous to the operation. During the middle part of the operation the respirations were considerably slowed and the patient became somewhat cyanotic. Directly after the patient's return to the ward respiratory failure occurred and the patient was found in a critical condition. Extensive hemorrhage, however, was taking place in the wound. The wound was at once opened and the bleeding vessels were caught. The patient was stimulated and made a good recovery. The respiratory failure in this case was in full accord with the experimental evidence. In the second case the left vagus was severed in removing glandular metastases following total laryngectomy. Twenty minutes before the operation $\frac{1}{100}$ of a grain of atropin was given hypodermatically and no effect upon either the circulation or respiration occurred when the nerve was divided. The patient recovered. The third case closely resembles the second. In the fourth case the patient had received a full charge from a shotgun, the muzzle of which, when discharged, was only a few inches from the patient's neck. The artery was torn off and the nerve ulcerated. The wadding and shot were firmly packed upon and driven into the torn nerve and other structures of the neck. The pulse was reduced to 42 beats a minute. The respirations were slow, exhibiting quickened respiratory action with lengthened pause, and prolonged expiratory phase. The slow pulse continued more than 2 hours, after which the "vagal" mechanism went into resolution and an extremely rapid cardiac action followed. The fifth case illustrates the effect of the local application of cocain to the vagus. In removing a mixed tumor of the parotid it was found necessary to free the nerve near the level of the top of the styloid process. During this manipulation the pulse dropped from 90 to 56. The separation of the nerve was stopped and a 4 % solution of cocain was applied upon a piece of cotton, and in 3 minutes the section of the nerve was again resumed, the pulse-rate having risen to 86. During the remainder of the resection of the vagus there was no appreciable alteration in the heart's action in spite of a more severe manipulation than had before been employed. In this case interference with the vagus had not been anticipated and no atropin had been administered. The sixth case reported is one of an emergency removal without anesthesia of a large goiter during unconsciousness from asphyxia. As a preliminary, $\frac{1}{100}$ of a grain of atropin was administered. The tumor was rapidly torn from its bed and the common carotid with the vagus was clamped; no cardiac inhibition took place. This patient made a good recovery.

Wm. J. Mayo¹ describes his experience in **surgical work upon the insane**. It is not with any idea of curing the mental condition that he has operated, but on the principle that the insane have the same right to a relief of surgical conditions that the sane have, and not infrequently in certain forms of melancholia the relief of the surgical condition for which the operation was done has aided materially in the patient's recovery. The indications for the surgical treatment of the insane are divided into 3 classes. "First, the surgical relief to physical ailments without regard to the mental condition; second, operations for the purpose of relieving the mental conditions of the patient; third, operations performed with the public welfare in view." It is in the first class that most of Mayo's work has been done, and he has shown that the cure of such conditions as hernia, cataract, hemorrhoids, lacerations of the cervix and perineum, has caused considerable amelioration of the mental symptoms. The relief of prostatic hypertrophy has also aided materially in lessening the so-called dirty habits of the insane. The second indication, of course, is a limited one. The author's experience in traumatic epilepsies and periodic attacks of insanity resulting from the same has shown but 2 cases in which relief from operative interference was marked. In suitable cases, however, operative interference is proper. Operations performed for the public welfare are questionable, and at the present time have no legal sanction. Mayo inclines to the belief, however, that the position taken by Ochsner and Brower, who advocate division of the vas deferens to prevent the propagation of insane persons, is commendable.

A. H. Levings² reports 3 cases of **peripheral anesthesia paralysis**. So far as the author has been able to find, there have been thus far but 5 cases reported in which both arms have been involved in the palsy. It is worthy of note that in nearly all the cases in which these palsies occurred the operation was one that lasted from 1 to 2 hours, and in nearly every instance the arm or arms implicated were very strongly abducted or drawn forcibly up over the head. To the 5 cases in which both arms were involved Levings adds another. A number of explanations have been offered for these palsies. It is important that surgeons consider the position which the arms occupy during prolonged operations. Attention is called to the interesting fact that in forcible extension or abduction of the arms for the purpose of producing artificial respiration, or while clearing out the axilla in carcinoma, or for other operative measures about the shoulders occupying short periods of time, palsy does not occur. [In a case of Gibbon's musculospiral palsy followed an interval operation for appendicitis. In this case it was believed that the palsy resulted from pressure upon the nerve, due to the arm resting upon the edge of the operating-table.]

Bolton³ reports two unique cases of **subcutaneous injury of the brachial plexus**, one occurring in his own service at the New York Hospital and the other in that of Hartley. In one case operation for relief of the condition was undertaken 5 weeks after the injury and in the other 9

¹ Med. Record, Aug. 3, 1901.

² Amer. Med., Feb. 8, 1902.

³ Ann. of Surg., May, 1902.

months. In each case there was complete palsy of the arm without any evidence of external injury. The reaction of degeneration was present in all the paralyzed muscles. In each case the clavicle was divided and the normal situation of the brachial plexus exposed. In each case there was found a mass of cicatricial tissue involving the plexus to such an extent that its removal and subsequent suture of the nerves were considered impossible by the operators. Small masses of this cicatricial tissue were removed, and when examined were found to contain numerous nerve-fibers. The origin of the scar tissue is the subject of conjecture, but Bolton thinks that a case of stab wound which has recently come under his care throws some light upon the question. In his patient a large hematoma formed in the lower part of the neck, and was not disturbed for 4 or 5 weeks after the injury. There was also a division of the outer cord of the plexus. When operated upon, the subclavian triangle was occupied by a considerable mass of cicatricial tissue. It is thought possible that in the other case there may have been a hematoma which later became organized, producing compression upon the nerves. [A. T. Bristow's important contribution upon avulsion of the brachial plexus was not published in time for insertion in this YEAR-BOOK (see *Annals of Surgery*, Sept., 1902). One of the editors (DaCosta) operated upon a case which he supposed was avulsion of the plexus, but incision disclosed the fact that the plexus was intact but embedded in scar tissue. The scar tissue was removed.]

DISEASES OF THE MUSCLES, FASCIA, ETC.

Tubby,¹ in discussing the subject of **tendon-grafting**, says that a muscle should be chosen whose function corresponds as nearly as possible to that of the paralyzed muscle. When deformity of the foot exists, this should be corrected before operation is undertaken. He has observed that the circulation and warmth of a paralyzed extremity always improve after these operations, and that the part is less subject to chilblains. The author's experience is based on 15 operations: 4 for calcaneo-valgus; 2 for talipes calcaneus; 1 for equino-valgus; 3 for equino-varus; 1 for calcaneo-varus; and 4 for spastic paralysis of the forearm and hand. In the 4 latter cases transplantation of the tendon of the pronator radii teres was performed, together with division of the flexor tendons of the wrist. In the 11 operations upon the lower extremity 6 gave good results, 5 fair, and in no case was there a failure. Of the four operations upon the hand, good results were obtained in 3 cases and a partial result in 1. The operation of tendon-grafting should not be undertaken in flail joints where all the muscles are involved, and should not be employed in slight cases of paralytic clubfoot.

White² reports a number of interesting cases in which he has practised **tendon transplantation for palsy**. In one case of palsy of the thumb the tendon of the flexor carpi radialis was attached to the paralyzed extensor tendons; the result in this case was a very slight improvement. Ten

¹ Brit. Med. Jour., Sept. 7, 1901.

² Brit. Med. Jour., Sept. 7, 1901.

cases are reported of palsy of the foot in which the operation of tendon transplantation was performed. Of these cases, 6 were greatly benefited, 1 case has been lost sight of, 1 case was a failure, and 2 were operated upon too recently to state the result. The operation in most of these cases consisted in the exposure of the Achilles tendon and dividing it longitudinally into 3 equal parts; the two inner portions were employed for lengthening the tendon, and the third portion, the outer third, was separated at the attachment to the os calcis and sutured to the tendon of the extensor longus digitorum. The tendon of the tibialis posticus was united to that of the extensor proprius pollicis. The tendon can be carried from its normal position to the point of insertion by tunneling under the superficial tissues with an artery forceps.

Sidney M. Cone¹ reviews the literature of **tendon transplantation** and reports a case in which benefit was derived from transplantation of the tendons of the peronei.

Crookshank,² in a brief communication, reports a case of **tenosynovitis of the tibialis anticus** which he believed resulted from prolonged indulgence in the game of "ping-pong" while wearing stiff-buttoned boots.

DISEASES OF THE SPINE.

Paul F. Eve³ reports a case of **spina bifida** in which operation was followed by **recovery**. The child was less than 3 months old, the tumor was rapid in development, rupture was imminent, and the pedicle of the protrusion, which proved to be a meningocele, was small. The pedicle was ligated and the sac excised.

John Lithgow⁴ reports a case of **spina bifida** (meningocele) situated in the lumbar region in a child 10 months of age; the pedicle was ligated and the sac excised; recovery ensued. He also reports a case of **encephalocele** in which excision was followed by death.

Leonard Freeman⁵ reports a case of **spina bifida** in which the **aperture was closed with a darning of silver wire** carried through the tendinous structures at the edges of the opening. The child was 7 weeks old and the growth, which was situated in the lumbosacral region, contained the elongated conus and some nerve-filaments; recovery ensued. In the majority of cases it is unnecessary to suture the spinal membranes. The remnants of the sac fold into a mass which plugs the opening and is held in place by the covering of wire; adhesions soon take place which renders suturing superfluous. The value of the Trendelenburg posture for preventing the escape of cerebrospinal fluid is open to question. The fluid is inclosed in a rigid tube, closed everywhere except at its lower end, just as if it were in a pipet with a finger over the upper opening. In the Trendelenburg position more blood would be sent to the head and more cerebrospinal fluid would be lost.

T. E. Schumpert⁶ reports 2 cases of **spina bifida** cured by the injection

¹ Johns Hopkins Hosp. Med. Bull., Aug., 1901.

² Brit. Med. Jour., May 3, 1902.

³ Jour. Am. Med. Assoc., Sept. 7, 1901.

⁴ Brit. Med. Jour., Jan. 18, 1902.

⁵ Jour. Am. Med. Assoc., Mar. 22, 1902.

⁶ New Orleans M. and S. Jour., Oct., 1901.

tion of Morton's fluid. In one case paraplegia persisted for 4 days after the injection.

F. F. White¹ reports a ruptured **spina bifida** (meningocele) in a married woman, aged 27 years, in which excision was followed by recovery.

Van Buren Knott² makes a contribution to the surgery of **spina bifida**. He reports 4 cases in which operation was followed by recovery. In 3 the tumor was situated in the lumbosacral region and in 1 case in the cervical region. The following conclusions are reached: "(1) Owing to the distressing nature of the affliction, the high mortality should not prevent attempts at surgical relief; (2) meningoceles, meningomyeloceles, and syringomyeloceles may be considerably benefited by operation; (3) the improvement in function cannot with certainty be estimated before operation, and pronounced evidences of nervous disturbance are not a contraindication to excision; (4) asepsis is absolutely essential, and, though difficult to secure, may be maintained by exercising extreme care; (5) the plan of having the suture lines of the meninges and the overlying tissues on different planes will in the majority of instances prevent leakage of cerebrospinal fluid; (6) the suggestion of Pearson, to prevent the escape of this fluid during a prolonged operation by stuffing the canal with gauze, is valuable; (7) large bony defects may be effectually closed by muscle much easier than by osteoplastic methods; (8) it is not necessary to keep the child off its back during the healing of the wound, as frequently advised; (9) children with hydrocephalus accompanying spina bifida should not be subjected to operation."

G. L. St. George³ reports 2 cases of **spina bifida** treated successfully, the first by the injection of Morton's fluid and the second by excision.

John Jenks Thomas⁴ reports a case of **myeloma of spine with compression of the cord**. The patient, a man aged 39 years, was suddenly attacked with severe pains between the shoulders, having previously been in good health. Later crural ataxia developed, the feet felt numb, there was a sensation of something tight about the abdomen, difficulty in retaining urine, and a lessening of the sexual desire. Sensitiveness to pain and to temperature was much diminished and appreciation of touch was somewhat diminished to the level of the fourth rib and the fourth dorsal spine in the back. The knee-jerks were increased and ankle clonus was present in both feet. Romberg's symptom was also noted and albumose was found in the urine. Four months after the onset of the symptoms J. C. Munro performed laminectomy. The lamina of the fourth dorsal vertebra on the left side was thin and bluish, with the cortex destroyed on the upper posterior surface. The medulla of the spinous process and of the lamina was full of soft reddish material, which extended anteriorly through the head of the rib to the left side of the vertebral body. Probably some of the growth lay anterior to the lamina, pressing on the dura. As much growth as could be curetted out was removed. This proved to be myelomatous on microscopic examination. After the operation the patient received bone-marrow and Coley's toxins. Marked improvement followed.

¹ Lancet, April 5, 1902.

² Lancet, Mar. 15, 1902.

³ Ann. of Surg., May, 1902.

⁴ Boston M. and S. Jour., Oct. 3, 1901.

The most constant symptoms of myeloma are pains in the chest, back, and extremities, accompanied by deformities and a gradually increasing anemia. Death usually ensues from pneumonia, pleural effusion, or exhaustion. Symptoms of pressure upon the cord constitute a not infrequent complication. The presence of albumose in the urine has been confirmed in 11 of the 19 undoubted cases of myeloma which have been reported. It is probable that albumosuria always points to disease of the bones. Myeloma is a tumor formation in the marrow of the bone, affecting pre-eminently the spongy bones, and usually sparing those of the extremities. It is produced by a multiplication of one of the varieties of the cells of the marrow, possibly the plasma cells. These tumors are always multiple, various nodules usually appearing about equally well developed, but showing no tendency to form metastases; occasionally there has been some infiltration of the periosteum or of the neighboring muscles.

Andrew J. McCosh¹ publishes some cases illustrative of **spinal surgery**. The reasons for rapid relief of pressure on the cord are as urgent as are those for the relief of pressure on the brain, although the operation of laminectomy for fractured spine is less satisfactory than trephining for fracture of the skull. The reverse is true of tumors. In cases of fractured vertebrae delay may be necessary because of great shock or uncertainty in diagnosis. When operation is not indicated, the symptoms are prone to be irregular. Paralysis are not complete and often muscles of the same group may not be equally affected. The anesthesia is apt to be partial, and paresthesia with patches of hyperesthesia is common. Symptoms of irritation are less pronounced. When there is definite pressure on the cord, the symptoms are more decided. Reflexes are prone to be abolished. If at the end of 12 or 24 hours doubt still exists as to the nature of the injury, it is better to explore, as the danger is slight. In a certain class of cases there is early and persistent improvement up to a certain point, when degenerative changes begin. In such patients the symptoms may be due to hemorrhage, inflammatory extravasation, or to pressure by fragments of bone. The two former disappear gradually, but the latter can only be removed by operation. It is frequently impossible to differentiate these causes, but as long as improvement continues it is wise to wait, unless it be positive that the compression is bony. Ten cases of spinal injury are reported to fortify the above deductions. In 159 cases collected by Lloyd there were 59 deaths following immediately after operation and 39 at a later period. Of McCosh's laminectomies, 6 in number, 2 recovered and 4 died. Operations for spinal tumors are more satisfactory than those for cerebral neoplasms. The reasons for this are greater accuracy in diagnosis, greater accessibility, and the less permanent damage of the cord prior to operation. The symptoms of spinal tumor are well marked, and within certain limits the growth can be accurately located. It is impossible to assign a certain lesion to any definite segment of the cord, but a lesion may usually be located in an area embraced by 3 spinal segments. There is no spot on the surface of the body, and practically no muscle, which is innervated by one nerve-root

¹Jour. Am. Med. Assoc., Aug. 31 and Sept. 7, 1901.

alone. Anastomosis between the spinal nerves is so perfect that the sensation of any one spot and the motive power of each muscle are derived from at least 2 segments of the cord. In addition, the afferent and efferent tracts run in the substance of the cord for some distance, perhaps 2 segments, before they reach the real nerve-center in the gray matter of the cord. Consequently it is easy to be mistaken and locate the growth lower than it really is. Tubercular masses are among the most frequent causes of pressure on the cord. Sarcomas are the most frequent spinal tumors. When it is impossible or useless to remove the growth, the agonizing pains may be assuaged by division of appropriate nerve-roots. At least 3 roots should be divided, because of the free anastomosis between the sensory nerves. No case of recovery following the removal of an intramedullary tumor or of a tumor from the ventral side of the cord has yet been reported. The prognosis is worse the higher the situation of the tumor. The operative mortality should not be above 10 %. The operation should not be delayed for the exhibition of anti-syphilitic treatment, unless there be a definite history of infection. Of the 51 operations for tumors of the cord collected by Lloyd, 10 % died and 31 % recovered. The great difficulty in many of these operations is the determination of the exact site of the spinous processes, especially in the cervical region. There is no rule whereby in certain cases various spines can be definitely located. The incision should be made as high as possible in order to secure abundant nutrition in skin normally supplied by nerves, and because of the reason already mentioned that the tumor has usually been found above the point localized by the physician. The operation should be done rapidly. Few vessels need the application of clamps; bleeding may generally be controlled by gauze pads held down by broad retractors. The removal of at least 3 laminae is generally necessary for proper examination of the cord. Support of the spinal column after the operation is unnecessary. McCosh employs a vertical incision with division and separation of the muscles attached to the posterior portion of the vertebral column. The lips of this wound are widely separated and the spines and laminae are removed by bone forceps. McCosh has operated 6 times for spinal tumor without an operative death. One patient is well at the end of more than a year, and another at the end of 2 months. Two died from sarcomas of other organs. One died at the end of 2 months from bedsores and cystitis, and one died of tuberculosis at the end of 15 months. Of the 6 cases, 4 were sarcomatous, one fibromatous, and one tubercular.

Richard H. Harte and Francis T. Stewart¹ report a **case of severed spinal cord in which myelorrhaphy was followed by partial return of function**. They review the literature of regeneration of the central nervous system and find that although a few investigators have claimed an anatomic and physiologic restoration of the central nervous tissue after injury or excision, practically all writers deny the possibility of such an event. Thus far no satisfactory clinical case has been reported in which a return of function has followed a total transverse division of the spinal

¹ Phila. Med. Jour., June 7, 1902.

cord in man, although cases are cited which are highly presumptive of such an occurrence, subsequent to partial lesions. The course of many surgical spinal lesions strongly suggests the probability of regeneration of the axons of the cord. Any considerable compression must destroy numberless axis-cylinders, either as the result of the compression itself or of the ensuing myelitis, and it is equally certain that many of these cases fully recover. There are cases in which every indication points to a complete crush of the cord, and in which recovery ensues; these cases are regarded by some neurologists as only partial lesions, their belief being that it is frequently impossible to diagnosticate a total transverse destruction of the cord unless the symptoms persist; if sensation and motion return, the question of regeneration is never considered, but this return is accepted as conclusive evidence that the axons were not cut or crushed. The case reported was that of a woman aged 26 years who was shot twice with a 32-caliber revolver and operated upon by Stewart. "One ball entered about 1 inch to the right of the seventh dorsal spine and passed directly into the spinal canal; the other lodged beneath the skin in the right lumbar region and was easily removed through the wound of entrance. There was immediate and complete abolition of motion and sensation below a line transecting the lower part of the tenth dorsal spine and a point $3\frac{1}{4}$ inches above the umbilicus, the distance between the ensiform and the umbilicus being 5 inches. This line of demarcation was sharply defined and was superimposed by a belt of hyperesthesia reaching as high as the ensiform cartilage; just before operation this layer of hyperesthesia also became anesthetic. The superficial and deep reflexes of the lower limbs could not be elicited. The temperature was 97.6° F., the pulse 120 and fair in volume, and the mind was clear. Three hours after the accident the patient was etherized, and an incision about 5 inches long made over the dorsal spines with the eighth dorsal spine for its center. After dissecting back the muscles on either side, the right lamina of the seventh dorsal vertebra was found to be crushed in and the left lamina of the same vertebra fractured at its base. With the aid of forceps the spines and laminae of the seventh and eighth dorsal vertebrae were removed and the rent in the membranes, through which could be seen the leaden bullet and a number of small fragments of bone lying between the ends of the severed spinal cord, exposed. After removing the bullet, the fragments of bone, and the lacerated nervous tissue, the distance between the segments of the cord was $\frac{3}{4}$ of an inch; this statement was verified by the assistants, Drs. Mitchell and Van Meter, by the etherizer, Dr. Fraley, and by Dr. Newlin, who was watching the operation. The wound was flushed with salt solution and the ends of the cord approximated with 3 chromicized catgut sutures passed by means of a small staphylorrhaphy needle, one suture being passed anteroposteriorly through the entire thickness of the cord and the other two being passed transversely. This part of the operation was attended with unusual difficulties because of the narrow space in which the suturing was conducted, because of the consistency of the cord, and because of the wide interval between the fragments, the catgut frequently tearing out before the ends were finally brought to-

gether. The dura mater could not be approximated. A small gauze drain, which was allowed to remain 24 hours, was carried down to the cord because of the oozing, the muscles were united with deep sutures of catgut, and the skin closed with silkwormgut. The patient was in better condition after, than before, the operation. . During the first 24 hours after operation there was sharp pain over the front of the chest and in the vicinity of the wound. The patient complained of nausea but could not vomit." At the end of the fifth day there were evidences of sensation in the lower extremities. The superficial reflexes returned on the seventh day and the patellar reflex was detected on the twenty-first day. The patient gradually improved, and at the end of sixteen months could voluntarily flex the toes, flex and extend the legs, flex and extend the thighs, and rotate the thighs. While sitting, the extended leg can be raised from the floor. Any movement is increased by strongly contracting the muscles of the upper extremities at the time of making an effort to move the lower extremities. The patient slides out of bed into her chair by her own efforts and is able to stand with either hand on the back of a chair, thus supporting much of the weight of the body. The bowels move every second day and are under perfect control, excepting the presence of diarrhea. About 1 pint of urine is passed 3 times during the 24 hours; there is sometimes incontinence during sleep. The menses are regular, preceded by sharp pains in the lower limbs and accompanied by cramps in the lower abdomen. The patient has the sense of touch, temperature, pain, and position all over. A pin-prick can be localized as low as a line running transversely through a point $2\frac{1}{2}$ inches below the umbilicus. A pin-prick can be differentiated from several pin-pricks and the pin-prick from a sharp blow from a pencil as far as the knee, but the localization of these sensations is not accurate. The muscles are moderately rigid and there is present on both sides marked but easily exhausted ankle and patellar clonus. The deep reflexes, elicited by tapping the tendo Achillis, the ligamentum patellæ, and the hamstring tendons, are marked and may be reinforced by muscular exertion of the face and arms, and by painful sensations, such as a sharp pinch, in the arms. On tickling the sole of the foot, the big toe flexes, the little toe abducts, and there is a feeble contraction of the tibialis anticus, the hamstring muscles, and the tensor vaginæ femoris. The rectus abdominis reflex is seen on both sides of the abdomen. There are no reactions of degeneration and no trophic changes in the skin or nails. The temperature has always been below 100° F. except on the fifth day after operation, when the thermometer registered 101° F. Although the patient has been accidentally bruised and burned, no bedsores have been developed.

Cases of fractured spine should be treated as are cases of fractured skull; if there are symptoms, immediate operation is imperative. If the cord is divided, the maxim of spinal surgery is "no interference"; but it is impossible to say that the cord is severed without inspecting it. If exploration reveals a total transverse lesion, the cord should be sutured. "The operation of myelorrhaphy will be specially indicated in cases in which the cord has been cut by a sharp instrument or severed by a projec-

tile. In cases in which the cord is crushed we have, at present, no infallible method of determining whether or not all the tracts have been destroyed. The axiom of spinal surgery is 'that compression, and compression only without injury to the cord, can be benefited by operation,' but sufficient compression to produce anesthesia or paralysis must be accompanied by the cutting, crushing, or tearing of thousands of axis-cylinders and, if axis-cylinders once injured never recover, the removal of pressure or of a spicule of bone sticking into the cord can do no good, and all operations are contraindicated except to control hemorrhage or combat sepsis." [The above article is set forth at considerable length because its importance demands it. It is one of those contributions which is likely to lead to a modification of accepted views and to radical changes in practice. In the debate on this paper at the meeting of the American

Surgical Association, Dr. Estes, of Bethlehem, reported a similar case in which, after suturing of the cord, there were positive signs of some regeneration.]

C. F. Painter and R. B. Os-good¹ have collected 18 cases of **rupture of the spinal ligaments**. From an analysis of these cases from the pathologic and anatomic point of view when this has been possible, and from a clinical standpoint in other cases, the following conclusions are drawn: "(1) Spinal ligaments, during life, may be ruptured, without fracture or dislocation; (2) nerve pressure symptoms may occur from a simple flexion of the vertebral column; (3) recovery

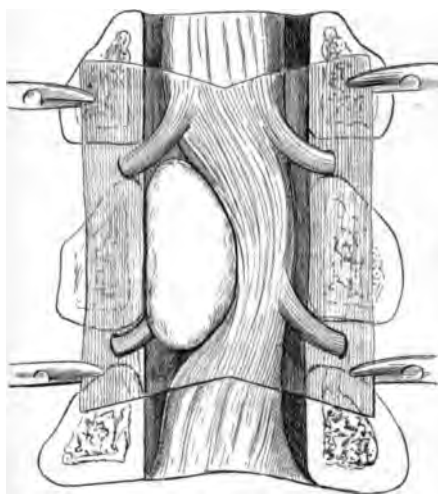


Fig. 34.—Diagrammatic representation of a tumor of spinal cord (Oppenheim, in Berl. klin. Woch., Jan. 13, 1902).

in these cases requires prolonged rest in a position which favors the repair of ligaments, and the effects of treatment speak more for the ligamentous rupture than for luxation or fracture; (4) the force which commonly produced the injuries (when stated) was one which, *a priori*, would be most likely to produce ligamentous rupture."

F. W. Langdon and D. I. Wolfstein² report a case of **gunshot wound of the spine** which was followed by paraplegia and persistence of the flexor plantar reflex. Operation showed that the bullet had entered the spinal canal at the level of the fifth dorsal vertebra; the dura was severed but the cord was apparently intact. Necropsy revealed a central hematomyelia.

H. Oppenheim³ reports a case of **tumor of the spinal cord**. The

¹ Boston M. and S. Jour., Jan. 2, 1902.

² Amer. Med., Dec. 14, 1901.

³ Berl. klin. Woch., Jan. 13, 1902.

patient was a man aged 40 years, who had complained of pain in the left hypochondrium for 2½ years which had been diagnosticated as intercostal neuralgia and rheumatism. At the time of examination there was some tenderness over the dorsal spine, retraction of the umbilicus toward the right, and absence of the abdominal reflex on the left. During the next 2 months paraplegia gradually developed. Sensation was entirely lost in the right leg, but only partly abolished in the left lower extremity. Both patellar reflexes were present, ankle clonus was marked on each side, and the Babinski phenomenon was noted. Girdle pain appeared and retention of urine ensued. The skin over the seventh and eighth ribs to the left of the spine was edematous. Sonnenburg removed the fifth, sixth, and seventh dorsal laminae and found a tumor the size of a hazelnut which compressed the cord from the left side and posteriorly. The tumor was outside the cord but inside the dura. The growth was removed and marked improvement in motion and sensation followed, and continued up until the time of the patient's death, 18 days after operation, from cerebrospinal meningitis. The growth proved to be a myxofibroma.

DISEASES OF THE KIDNEYS AND URETERS.

Francis S. Watson¹ deals with **movable kidney**, paying especial attention to its **consequences and etiology**, and reporting some postoperative observations made in cases of movable kidney. The first part of his paper consists in a protest against the view too often held by medical men that movable kidney is, with the rarest exceptions, a harmless condition. He concedes that movable kidney is frequent in neurasthenic patients; that in most instances it is not productive of serious injury, and that the symptoms referred to the kidney by the patient are frequently not due to its abnormal movability but are neurasthenic in character. It is the extreme degree of these opinions only that Watson combats, because it may result in serious consequences to the patient. It must be remembered also that the neurasthenic condition is often directly dependent upon and secondary to the movability of the kidney. A movable kidney, besides producing neurasthenic symptoms, may be the cause of hydronephrosis or pyonephrosis; may result in the fixation and abnormal position of a previously movable kidney; and, in a few rare instances, may result in gangrene of the organ produced by occlusion of its blood-vessels. Illustrative cases of each of these conditions are presented. The etiologic factors usually suggested for movable kidneys are enteroptosis, sudden wasting of the perirenal fat, increase in the size and weight of the kidney, downward weight upon the kidney by an enlarged liver and by large pleuritic effusions, and a similar pressure through tight lacing. Traumatism is a frequent immediate exciting cause. Neither one nor all of these causes are applicable to all cases, since movable kidney occurs in individuals in whom none of them is present. Watson has examined carefully 13 cadavers to determine roughly what the structures are which are chiefly concerned in the fixation of the kidney. It is stated that the essential structures con-

¹ Boston M. and S. Jour., Sept. 19, 1901.

cerned in the limitations of the motions of the kidney are those connected with its posterior surface and upper pole. These structures are those which form the attachment between the posterior and upper aspect of the tunica propria and the fascia covering the lumbar muscles and the peritoneum covering the diaphragm respectively, aided by the less essential bands connecting the anterior surface with the peritoneum overlying it. This view is in accord with that expressed after an extensive investigation by Glantenay and Gosset. Wolkoff and Delitzen have presented an elaborate work dealing with the anatomic features influential in the fixation of the kidney. These authors contend that the kidney is held in its normal position largely by the peculiar shape of the paravertebral fossa. Watson has had no opportunity of confirming these observations, but thinks they are suggestive and significant. Watson closes his discussion with a report of the postmortem findings in 6 cases of movable kidney. In 3 cases when the cadaver was placed in the upright position the kidney dropped down toward the pelvis, but did not during its descent produce any bend in the course of the ureter sufficient to have affected the flow of urine. There was no rotation of the kidney either on its long or on its transverse axis. The kidneys were apparently normal in all 3 of the cases. In the fourth case, that of an old man, both kidneys were freely movable. In this case the probable restraint to further descent of the kidney were several small blood-vessels at the upper ends of the organs and the fibers of the perirenal fascia, which were but slightly developed. In both the fifth and sixth cases the further descent of the kidney was restricted by a firm band of fibrous tissue which was derived from the subserous lining of the parietal peritoneum and passed transversely across the front of the kidney as it dropped down. In one of the cases the lower pole of the kidney became engaged against this band and the upper end fell forward whenever the body was inclined in front of the perpendicular line. Paul Thorndike has encountered a similar condition in life.

Henry Morris¹ reaches the following conclusions in discussing the **symptoms and treatment of movable kidney**: "(1) When movable kidney is associated with enteroptosis, no operation should be performed on the kidney unless it is evident that the more serious symptoms are due to the mobile kidney alone, and not until after the trial of a well-fitting abdominal support and the careful dietetic and medicinal treatment of the gastric and intestinal disorders. Should these means fail and the kidney evidently be most at fault, nephropexy, followed by the wearing of an abdominal belt, should be tried. (2) When a movable kidney is complicated by a movable liver, or when both kidneys move, the same rule should be followed as in general enteroptosis; in the case of both kidneys moving (when both organs have given trouble) they should be fixed one after the other at an interval of a week, so that convalescence from both operations may be taking place simultaneously. I have in several instances thus operated upon both organs with the most satisfactory results. (3) When the movable kidney occurs in an hysteric or neurasthenic patient, all palliative means should be tried before resorting to an operation, and

¹ Lancet, Nov. 30, 1901.

the patient's friends should be informed of the uncertainty of the result from operation. The statistics show that a cure may be hoped for by nephropexy in about half of these cases. (4) For uncomplicated movable or floating kidney, in which the principal symptoms are pain, and gastrointestinal troubles, the operation may be confidently advised and carried out without any previous trial of belts or of rest. (5) When renal crises are a feature of the case, nephropexy ought to be strongly urged because of the impossibility of keeping the kidney in its proper place by a belt, and because of the constant risk of hydronephrosis and recurring pain even if the renal crises can be kept under control. (6) When a movable kidney gives rise to no inconvenience, an operation ought not to be thought of and a belt need not be worn."

After a discussion of the question of **floating kidney in women**, Henry D. Beyea¹ recommends the following operation, which was first suggested and put into practice by Penrose: A straight incision is made in the lumbar region for 3½ inches; the perirenal fat is exposed and removed; the kidney is delivered and an opening made in the perirenal fascia at a point about 1 cm. above the ureter and renal vessels, in which is placed a rubber drainage-tube of sufficient length to surround the kidney and protrude from the wound. A second tube is passed around the kidney through the perirenal fascia below the ureter and vessels. The kidney is now returned to its position and the tubes tied over a piece of gauze placed over the wound. The external wound is closed except for a small opening for the protrusion of the tubes. As the tubes pass through the perirenal fascia there is no chance of their becoming misplaced. Sutures are removed on the tenth day, but the tubes are allowed to remain for 3 weeks. The operation has been performed in 8 cases, 3 of which have gone over 2½ years, 3 over 2 years, and 1 over 1 year, and the last over 6 months, without any evidence of a return of the trouble.

Thomas Carwardine² recommends the **fixation of movable kidney by means of strong carbolic acid**, and records 6 cases in which he has employed this treatment in connection with suturing or the employment of gauze slings after the manner of Senn. The author maintains that the application of the acid produces no injury to the kidney, but results in its firm fixation. He recommends the method of suspension with gauze slings combined with cortical carbolization.

Byron B. Davis³ recommends an operation for **anchoring the kidney** which he has employed successfully in one case. The method consists in first splitting the capsule and dissecting it back, then separating a portion of the quadratus lumborum about the size of the little finger from the body of the muscle, but without detaching either extremity. This strip of muscle is then placed between the flaps of the capsule, which are sutured over it. This operation fixes the kidney by means of a living anchorage. The author has discovered that Baldwin has already employed a method similar to this, but he himself practised it without any knowledge of Baldwin's work.

¹ Amer. Med., Sept. 21, 1901.

² Lancet, June 28, 1902.

³ Jour. Am. Med. Assoc., May 10, 1902.

Geo. H. Mallett¹ discusses **movable kidney**, and offers a possible explanation of failure in some cases to relieve symptoms by nephrorrhaphy. The author believes that when the symptoms persist after operation, in most instances the kidney has been fixed in malposition, being frequently rotated outward on its vertical axis. In fixing a movable kidney the surgeon should be careful to see that the ureter and vessels are not interfered with.

Bramwell² reports a case of **movable kidney producing pyloric stenosis and constriction of the duodenum by peritoneal bands**. The patient was a woman 49 years of age who for 19 years had suffered from symptoms of indigestion. The right kidney was movable and a mass could be felt in the region of the pylorus. Dilation of the stomach was a marked symptom. The patient died as a result of sudden increase in the size of the stomach from distention. The stomach was found to be enormously dilated, its walls being as thin as paper. The kidney was movable to the extent of 3 inches and from its surface 3 peritoneal bands extended to the pylorus. It was quite clear that the descent of the kidney caused stenosis of the pylorus and duodenum.

Arthur T. Cabot³ reports a case of **severe hematuria from movable kidney** and presents a discussion of the causation of this condition. Blood in microscopic amount is not uncommonly found in the urine secreted by movable kidney, but the loss of blood in serious amounts is a great rarity. The case reported by Cabot is that of a woman 43 years of age who suffered from severe hematuria which produced serious anemia. The right kidney was freely movable; no other condition could be found which would explain the hematuria. It was believed to be due to the extreme congestion of the kidney caused by its downward displacement. The patient was placed in bed with her shoulders lowered and hips raised, so that the downward drag of the kidney might be relieved. At the end of 48 hours there was a marked decrease in the amount of blood, and after a short time the urine was wholly free from discoloration. After a few days the patient was allowed to assume the horizontal position for about 4 hours; on the next day blood reappeared in the urine. The patient was kept in the position described for several weeks, when, becoming tired of it, she was allowed to sit bolstered up in bed for 20 minutes each day. When this was done, blood became at once noticeable in the urine, though in far less amount than before. Operation was then determined upon. Except a thickened capsule, no abnormality of the kidney could be found. The organ was fixed to the transversalis fascia. Several months after the operation it was reported that the patient had not had any blood in the urine and was free from pain. A careful note of symptoms in this case and the way in which they were influenced by position leaves little doubt as to the cause of the hematuria. Cabot discredits the theory of congestion due to twisting of the kidney. Rotation of the kidney is an extremely infrequent condition; the author has seen it but once, and in this case there had been an attempt to fix the kidney. The displacement which usually takes place is

¹ Amer. Med., Mar. 20, 1902.

² Brit. Med. Jour., Oct. 19, 1901.

³ Boston M. and S. Jour., Mar. 6, 1902.

simply a slipping downward of the whole organ. It is natural that this should produce some obstruction of the thin-walled vein. The wall of the artery is thicker and its circulation more vigorous, and its length, too, is greater than that of the vein. The vein therefore suffers more from the malposition than does the artery. Examination of the literature confirms Cabot in his belief that hemorrhage, the result of congestion due to a displaced kidney, is a rare condition. [In one case operated upon by DaCosta a twisted pedicle of a movable kidney was demonstrated. Blood was present in the urine in considerable amount.]

J. Hutchinson, Jr.,¹ deals with **floating kidney as a cause of obstructive jaundice and hepatic colic**, reporting 2 cases in which a floating kidney was the undoubted cause of these conditions. In neither of the cases were gall-stones present. Floating kidney is by itself, and without the intervention of gall-stones, capable of producing severe cholecystitis and obliteration of the gall-bladder, as is proved by one of the cases reported. In the case referred to the conditions of the gall-bladder mentioned were found upon exposure. Later, nephropexy was performed and relieved the patient of all symptoms. The two cases reported prove the importance of taking into consideration floating kidney as a cause of jaundice and hepatic symptoms, especially in young women. The author has made several dissections, in order to, if possible, discover the mechanism of the obstruction of the gall-ducts. So far as his observations go, he has been unable in normal subjects to discover the so-called hepato-renal band of peritoneum which is described by Weisker as of much importance in the mechanism whereby a floating kidney on the right side may produce jaundice. Hutchinson states that there is nowhere any ridge or band connecting the right kidney with the liver or gall-bladder, unless it be present as a pathologic result, nor does the moving of the right kidney forward and downward produce any such fold. The right kidney is closely connected with the second part of the duodenum, and downward displacement of this organ must to some extent affect the position of the duodenum. The following factors are presented to explain the occurrence of obstructive jaundice in floating kidney: "(1) Downward displacement of the third part of the duodenum, with stretching of the common bile-duct; (2) displacement of the gall-bladder and sharp kinking of the cystic duct; (3) torsion of the vertical portion of the duodenum, and perhaps even of the bile-duct."

Fred. Griffith² reports a case of **floating kidney** which he believes was due to **fecal impaction**. The removal of the impaction resulted in the relief of all symptoms due to the floating kidney in this case.

The question of **renal tension and its treatment by surgical means** is discussed by R. Harrison, J. W. Cousins, G. Barling, and R. C. Chieken.³ The satisfactory results frequently obtained from exploratory incision of the kidney for various conditions led Harrison to infer that renal tension was probably the cause of the symptoms, and that its relief by incision of the kidney capsule was justified in certain cases. It is compared to the

¹ Practitioner, Feb., 1902.

² Med. Rec., July 20, 1901.

³ Brit. Med. Jour., Oct. 19, 1901.

operation of iridectomy for glaucoma, and puncture or limited incision in orchitis. It is only by palpation and inspection of living kidneys that one becomes convinced of the importance of tension as an etiologic factor in some of the conditions which are included under the general term of Bright's disease. Harrison refers to 6 cases in which incision of the capsule was followed by recovery. One was a nephritis from scarlet fever; one from exposure to cold; one a subacute nephritis from influenza; one a nephritis associated with injury; and another a cystic degeneration of the kidneys resulting after trauma. Harrison suggests the following indications for surgical interference in cases of nephritis: "(1) Progressive signs of kidney deterioration, as shown by the persistence or increase of albumin when it should be diminishing or disappearing from the urine, as in the natural course of inflammatory disorders ending in resolution; (2) marked suppression of urine or approaching this state; (3) where a marked disturbance of the heart and circulatory apparatus arises in the course of inflammatory renal disorders." In performing the operation the incision is best made along the convex border of the kidney, although it may seem wise to make separate punctures at points where the kidney appears to be very tense; care should be taken not to wound the pelvis of the kidney. Drainage after the operation is very necessary. Since a division of the capsule of one kidney relieves the tension of the other as well, it makes little difference which kidney is chosen, unless there is marked pain or some other definite indication for a choice of one side or the other. It is thought that the subjects best suited to this treatment are those suffering from subacute nephritis. Cousins expresses the opinion that probably the most favorable cases for surgical interference are those of acute inflammation associated with infection through the blood. Barling thinks that the large majority of cases of renal tension are best treated by medicinal measures. Chicken does not approve of the incision of the capsule for high tension alone.

George M. Edebohls¹ writes on the **cure of chronic Bright's disease by operation**. The author was the first to propose the **decapsulation of the kidneys** for chronic Bright's disease.² The idea of treating chronic Bright's disease by this method originated from the very favorable influence produced upon this disease in a number of cases in which the operation of nephropexy was done for movable kidney. The first operation performed deliberately with the object of curing chronic Bright's disease was done by the author on January 10, 1898. During recent years nephropexy has been preferably performed upon patients suffering from chronic nephritis. A table of 18 cases illustrates the author's treatment of this condition by surgical interference. All of these 18 patients were women whose ages varied between 19 and 45 years. Only cases of chronic Bright's disease are included in the list. Putting aside the more complicated classifications of nephritis, Edebohls divides the condition into interstitial nephritis, which includes those cases in which the greatest evidence of inflammation is found in the connective tissue of the kidney; into parenchymatous nephritis, in which the disease affects the secretory apparatus

¹ Med. Rec., Dec. 21, 1901.

² Med. News, April 22, 1899.

more particularly; and into diffuse nephritis, in which both the parenchyma and the connective tissue of the organ are equally affected. It is said that a recognition of the condition during life is easier than it is postmortem. Of the 18 cases operated upon, 5 had chronic interstitial nephritis; 4 had left chronic interstitial nephritis; 4 had right and left chronic interstitial nephritis; 2 had right and left chronic parenchymatous nephritis; and 3 had right and left chronic diffuse nephritis. In 14 of the 18 cases both kidneys were operated upon; in 12 instances at one sitting and twice at 2 sittings. In 4 cases the operation was performed upon one kidney only, in each instance the right. Of the 4 patients whose right kidney alone was operated upon, 2 have recovered completely. In 6 of the 8 cases in which the disease was said to be confined to one side the healthy condition of the other kidney was verified at operation by its exposure and critical inspection. The fact that chronic Bright's disease could be a unilateral affection was a matter of surprise to the author. It is thought in these cases where the disease starts in one kidney that involvement of the other will take place before the patient's death, and consequently unilateral disease is seldom seen postmortem. In all of the operations recorded the kidney was delivered upon the skin of the back, except in one case, in which it was found impossible to perform delivery. When the kidney was exposed in this way, it was easy to demonstrate "the adherent capsule, nodulation, granular condition of the subcapsular surface, shrinking, unequal contraction and occasional cyst formation of chronic interstitial nephritis; the enlargement; cloudy swelling, mottling, and discolorations due to circulatory and degenerative changes of chronic parenchymatous nephritis; the thickening, general or localized, of the capsule proper, of the kidney, and the secondary inflammatory changes in the perirenal fat common to both varieties of chronic Bright's disease." Except in the last 2 cases Edebohls has in each operation stripped off about one-half of the capsule proper of the kidney; in the last 2 cases he performed total excision of the renal capsule. "Excision of the renal capsule proper is performed as follows: The patient is placed prone upon the table, with the author's kidney air-cushion underlying and supporting the abdomen. Both kidneys are thus rendered accessible to operation without the necessity of changing the patient's position. An incision is carried from the twelfth rib to the crest of the ilium along the outer margin of the erector spinæ, without opening the sheath of that muscle. The fibers of the latissimus dorsi muscle are bluntly separated in the direction of their course, without cutting. The iliohypogastric nerve is sought for and drawn on one side or other, out of the way of harm. Division of the transversalis fascia exposes the perirenal fat. This is divided over the convexity of the kidney until the capsule proper is reached. The fatty capsule is now bluntly separated everywhere from the capsule proper, the dissection advancing on either aspect and around both poles of the kidney until the pelvis of the kidney is reached. Now and then the fatty capsule may be found so thickened and adherent, as the result of chronic perinephritis, that the scissors or knife may be required to separate it from the capsule proper. The kidney with its capsule proper is next lifted from its

fatty capsule bed, and, if possible, delivered through the wound. The capsule proper is divided on a director along the entire length of the convex external border of the kidney and clean around the extremity of either pole. Each half of the capsule proper is in turn stripped from the kidney and reflected toward the pelvis until the entire surface of the kidney lies raw and denuded before the operator. In separating the capsule proper from the kidney, care must be exercised not to break or tear away parts of the kidney, which is often both very friable and very firmly connected with its capsule proper. The stripped-off capsule proper is next cut away entirely, close to its junction with the pelvis of the kidney, and removed. Delivery of the kidney makes this otherwise difficult work easy. If the kidney cannot be delivered, the capsule proper must be entirely peeled off the kidney by the fingers in the bottom of the wound, and excised as far as possible, any remaining portion being simply reflected backward around the root of the kidney, where it will curl up and stay. The kidney is dropped back into its fatty bed and the external incision is closed. Drainage, except when the parts are extremely edematous, is dispensed with. After both kidneys have been thus operated upon, the dressings are applied and the patient is put to bed." Ether was the anesthetic employed in every case with the exception of one, and at no time was there any untoward effect from its use; in the exceptional case nitrous oxid and oxygen were employed, and this combination Edebohls would prefer in cases of far-advanced Bright's disease provided he could obtain the services of an expert anesthetizer. Edebohls has not had a death in any of his operations for the cure of Bright's disease. One of the patients died one year later, after an operation for a ruptured tubal pregnancy, and another died following a hysterectomy nine years after operation upon her kidneys. The author did not perform either of these subsequent operations. Of the 9 patients operated upon more than a year ago, only 1 shows a failure of the operation to cure the disease. Three years after operation upon the right kidney another surgeon removed the left, and the patient survived this operation 5 years. The fact that she was able to live this length of time would go to show that there must have been some improvement in the kidney operated upon originally. Of the more recent cases, rapid improvement is observed in them all. Edebohls gives rather extensive notes of one or two of the patients so as to show how far advanced chronic Bright's disease may become and yet be relieved by the operation he proposes. One of the patients at the time of operation was completely water-logged, unable to breathe in the recumbent posture, with pulse 120, respiration 30. temperature 100° F., and edema of the entire lower lobes of both lungs. Improvement in this case was slow but marked. Eight patients operated upon and observed from 1 to more than 8 years have remained cured as the result of the operation, and none of them have received any other treatment. They are entirely free from all symptoms referable to the kidneys and the urine remains permanently free of albumin and casts. The first beneficial effect of the operation, indicated by an increased flow of urine, does not show itself usually before the tenth day. Edebohls does

not wish to appear too sanguine regarding the result of operation in these cases, and he does not think that every case should be operated upon. The complications of advanced stages of chronic Bright's disease will often produce a failure of the operation, though this latter may improve the kidney lesion. Three of his patients, however, show a cure after the most marked Bright's disease. In discussing the way in which cure takes place, the author refers to observations made in 3 operations upon kidneys that had previously undergone the operation of nephropexy. At the second operation it was found that the kidney was held by strong connective-tissue adhesions to its surroundings; that in these adhesions or bands there were found large and numerous blood-vessels running between the kidney and the adjacent tissues, as was easily demonstrated by the frequent necessity to ligate them; that the newly formed arteries greatly predominated over the newly formed veins; and the important fact that the blood in all the arteries flowed *toward* the kidney. It is thought that this increased blood-supply to the kidney "leads, most probably, to gradual absorption of the interstitial or intertubular inflammatory products and exudates, thus freeing the tubules and glomeruli from external compression, constriction, and distortion, and permitting the reestablishment in them of a normal circulation. The result of this improved circulation in and between the tubules and glomeruli is the regenerative production of new epithelium capable of carrying on the secretory function." This idea of the way in which cure takes place is borne out by the fact that the improvement does not take place for at least a month, and is gradual. The result of this operation is not the same as that which occurs when renal tension is relieved in acute nephritis as first suggested by Reginald Harrison. Other writers have observed the disappearance of casts and albumin from the urine after the operation of nephropexy in which a portion of the renal capsule has been removed. Rose, Wolff, Ferguson, and others have each reported such cases. Edebohls compares this operation for chronic Bright's disease to that which has been performed during late years for the cure of cirrhosis of the liver, and thinks that an important part of this latter operation consists in producing adhesions between the liver and the diaphragm. "As the result of my experience thus far, and from my present standpoint, I am prepared to operate upon any patient with chronic Bright's disease who has no incurable complication, or one absolutely forbidding the administration of an anesthetic, and whose probable expectation of life, without operation, is not less than a month."

A. Rose,¹ in a letter, contests Edebohls's claim to priority in the **surgical treatment of Bright's disease**, referring to what has been done by N. Rose, Newman, and Ferguson prior to the work and publication of Edebohls. Edebohls² replies to this communication at some length.

The literature of the **surgical treatment of Bright's disease** is carefully reviewed by Ramon Guiteras,³ who reports briefly 3 cases on which he has operated for this condition. Sufficient time, however, has not elapsed since operation for definite conclusions to be drawn.

¹ Med. Rec., Mar. 22, 1902.

² Med. Rec., April 26, 1902.

³ N. Y. Med. Jour., May 17, 1902.

He makes the following propositions: "(1) Nephropexy is always a beneficial procedure in a movable kidney in a patient suffering from chronic nephritis; (2) nephrotomy has proved a valuable operation in unilateral chronic nephritis associated with hematuria and nephralgia; (3) the value of a complete decapsulation of the kidney as a therapeutic measure in chronic Bright's disease has not as yet been determined, as the procedure has not been employed extensively enough to warrant positive conclusions."

William Jepson¹ reports a case of **congenital cystic kidney** in a child 4 months and 14 days of age. The symptoms calling attention to this condition were very acute, the patient suffering from an immensely but apparently uniformly distended abdomen, a high temperature, rapid pulse, hurried and embarrassed respiration, vomiting, and no movement of the bowels for nearly 4 days. Considerable localized inflammation was present in the abdominal wall near the middle line. Jepson thought at one time that the condition might be one of distended urachus, but aspiration of the fluid and catheterization of the bladder soon showed that this was not the condition. A cyst of unknown origin was diagnosed and the abdomen opened. The cyst-wall was found adherent to the abdominal wall over an area of probably 3 or 4 inches in diameter about the umbilicus and to the right of it. The cyst was emptied and its point of attachment with difficulty determined. Eliminating all other structures, however, a diagnosis of congenital cystic kidney was made. The author does not describe his operation, but states at the conclusion of his paper that nephrectomy was done. The child made a rapid recovery without symptoms. Operation was performed on November 30, 1900, since which time the child has enjoyed the best of health. While prenatal development of cystic kidney is rare, cases have been reported in which it reached a degree of development which precluded a normal birth and necessitated evisceration. Children surviving birth usually succumb early to the effects of pressure. Toxemia resulting from inadequate renal function is another potent factor in the early demise of these patients. In most instances the disease involves both kidneys, and not infrequently is associated with some other malformation. Hektoen has made an exhaustive study of this subject, and divides the causes of cystic kidney into the following sets: (1) retention; (2) cystadenoma; and (3) teratologic. So far as Jepson has been able to discover, his patient is the youngest child that has survived a nephrectomy. Roswell Park did a successful nephrectomy for a congenital cystic kidney upon a child 23 months of age, and Rovsing operated successfully upon a child 9 months old for congenital hydro-nephrosis.

Albarran² discusses the **advisability of performing nephrectomy in certain cases of hydatid cyst of the kidney**, reporting a case in which, because of the thickness of the walls of the cyst and the almost complete destruction of the kidney by direct invasion and by compression, he performed this operation. So extensive and dense were the adhesions to the

¹ Jour. Am. Med. Assoc., Sept. 28, 1901.

² Bull. et Mém. de la Soc. de Chir., No. 21, 1901.

surrounding parts that during the process of the operation both the pleural and peritoneal cavities were opened. The patient recovered. When the diseased kidney is so much distended as to render it incapable of performing its function, and when, because of anatomic conditions, the operation is contraindicated, Albarran believes that nephrectomy is preferable to nephrostomy. The lumbar route is much to be preferred to the abdominal one in dealing with hydatid cyst of the kidney. In all 4 of the cases in which lumbar nephrectomy was performed recovery took place. The operation of Delbet, in which the cyst is removed and the resulting gap in the kidney closed, is inapplicable in most cases because of the thickness and calcified condition of the cyst-wall. The kidney structure is not only invaded by the hydatid disease, but is also destroyed by hydronephrosis resulting from compression or displacement of the ureter.

Svenning Dahl¹ reports a most **unusual case of lipomatous perinephritis following chronic suppurative pyelitis** in which he performed a **successful nephrectomy**. The patient came into Dahl's care suffering from renal fistulas following operation. The history indicated the previous sequence of events to have been renal calculus, suppurative pyelitis, and intermittent pyonephrosis which had penetrated into the perinephritic tissue, causing perinephritic suppuration, which was due to too late and perhaps inadequate operative interference and had caused extensive burrowing of pus upward behind the liver and downward along the psoas muscle. After an extensive incision in the loin, and a second anterior one through the abdominal wall, the author succeeded with difficulty in performing nephrectomy. The operation was difficult owing to the dense and tough connections with all surrounding organs. The specimen was a rare one, its color and appearance being those of adipose tissue. It had preserved the contour of the kidney, but the whole gland structure had been substituted by true adipose tissue. The pelvis contained a phosphatic calculus; there was no trace of renal vessels. Microscopic examination showed a layer 3 mm. thick of sclerotic renal tissue about the remains of the pelvis. The author refers to previous reports of similar conditions.

Granville MacGowan² reports a case of **severe and prolonged mononephros hemorrhage** for which he performed **nephrectomy**. The patient was a man 35 years of age whose general health was good and who had never suffered from gonorrhea or given evidence of being tuberculous. Profuse painless hematuria occurred 8 years previous and ceased without treatment. Two months before coming under MacGowan's care the hemorrhage returned and gave rise to pain. The pain and frequent micturition subsided, but the hemorrhage continued, rendering the patient very anemic and weak and causing him to lose 30 pounds in weight. There were no symptoms to call attention to either kidney. Treatment directed to the bladder proved useless. A cystoscopic examination revealed blood issuing from the right ureter and several clots within the bladder. This condition was confirmed by suprapubic cystotomy, which was done to satisfy a consultant's want of faith in the cystoscope. Two

¹ Chicago Med. Recorder, Feb. 15, 1902.

² Med. News, Dec. 7, 1901.

weeks later the kidney was removed. Before removing the organ blood could be seen passing from the pelvis down into the ureter. The kidney was removed after carefully incising it. MacGowan was surprised not to find a papilloma in the pelvis or in one of the calices. The organ was very much congested, presenting a general purpuric condition. The patient recovered satisfactorily from the operation, the suprapubic wound healing and the patient being now in excellent health. A microscopic examination of the kidney revealed no pathologic condition.

Boyd and MacFarland¹ report a case of **hypernephroma of the kidney complicating pregnancy**. The patient was admitted to the hospital in the sixth month of pregnancy, suffering from threatening miscarriage. Five days after admission spontaneous miscarriage took place. Prior to miscarriage the presence of a tumor which could be felt at the lower border of the liver was discovered. This tumor was more marked after delivery and appeared to be rapidly increasing in size. Dulness over the growth extended into the right flank. Incision was made in the right hypochondrium. A condition was found which was supposed to be a retroperitoneal abscess. The general peritoneal cavity was protected with gauze and a large quantity of thin, dark, very offensive fluid was evacuated. Drainage was established and the patient returned to bed in a critical condition. The patient died one month after the operation. Postmortem examination revealed a tumor embedded in the upper portion of the right kidney but not involving the kidney structure, the latter being quite normal until a sharp line of circumscription was reached which separated the tumor from the kidney-substance. The growth was about the size of a walnut and occupied a rounded excavation in the superior external and posterior portion of the kidney. The cavity in which it lay was connected with the abdominal wall by a fistula. MacFarland made a careful microscopic examination of the growth, and states that it did not grow from the right adrenal itself, as that organ was found normally placed and reasonably normal. The growth is called a hypernephroma.

Llewellyn C. P. Phillips² discusses at length the **surgical aspects of glycosuria and diabetes**. The cases described are divided into 4 classes: (1) Those in which glycosuria is caused by the surgical lesion; (2) those in which the glycosuria causes the surgical lesion; (3) those in which the two conditions exist independently and do not influence each other; (4) those in which the glycosuria exerts a baneful influence upon some other disease or upon an injury. Reference is also made to the temporary glycosuria which is produced by such drugs as opium. In the first class are found injuries and septic conditions; in these the sugar is small in amount, is transitory, and not infrequently accompanied by albuminuria. Numerous cases are referred to which show the dependence of glycosuria upon injury and such septic conditions as appendicitis, pyosalpinx, strangulated hernia, etc. Regarding the second class of cases, Phillips expresses the doubt whether glycosuria can cause any condition requiring surgical treatment except balanoposthitis and cataract. Diabetic gangrene, carbuncle, etc., are only caused indirectly by diabetes through arteriosclerosis

¹ Am. Jour. Med. Sci., June, 1902.

² Lancet, May 10 and 17, 1902.

or nerve degeneration. Diabetes should be looked upon only as a complicating condition. Balanoposthitis is certainly due to the irritation produced by the urine, and is sometimes of a very serious character; probably the best treatment consists in cleansing the parts after each act of micturition. Legendre has operated upon 102 cataracts due to diabetes with 99 recoveries. The third class is the most interesting from a surgical point of view. A number of tables are produced showing the results of operations in various parts of the body in the presence of glycosuria. Sixteen operations were performed about the face and mouth with 11 recoveries; 15 operations upon the breast with 13 recoveries; 24 operations upon the female generative organs on 23 patients with 5 deaths,—the plastic operations of this series were peculiarly successful; 6 operations upon the male generative organs upon 5 patients with 3 deaths,—in 2 of the fatal cases no precautions were taken regarding coma; 15 operations were done upon abdominal organs other than generative with 11 recoveries,—3 of the fatal cases were moribund before operation; 2 cases of incision of the rectum are recorded, 1 of which recovered; 9 operations were performed upon the extremities of 7 patients with 3 deaths. The recorded cases of fractures in diabetes, which are taken from the case-books of St. Bartholomew's Hospital between the years 1884 and 1900, show that the results obtained as regards union were quite good. Gangrene occurring in diabetes shows a high mortality from amputation which is due largely to sepsis. Otitis media is common in diabetics, the infection arising in the pharynx, which is often the seat of chronic conditions. The onset of this condition is sudden and the symptoms severe; the tendency toward mastoiditis and necrosis is great. Operation should be undertaken in this condition in spite of the presence of sugar. In these cases particular attention should be paid to Gerhard's reaction and to the amount of ammonia excreted. In all, Phillips presents 92 operations which have been performed on 83 patients, of whom 23 died. This apparently high mortality is easily explained by the fact that 3 of the deaths seemed inevitable before operation; 2 of the cases were strangulated hernia; in one of which coma was already appearing, and in the other the bowel was gangrenous. In many of the operations the diabetic condition was not known and no treatment was instituted. The operations of expediency were particularly successful, including 5 radical cures of hernia, 6 plastic operations on the female generative organs, and 1 operation for hemorrhoids. In 11 of the fatal cases death was due to coma and in 7 to sepsis. The percentage of sugar is no criterion as to fatal results; the highest percentage in the fatal cases was 8 and in non-fatal cases was 11.5. Albuminuria should be looked upon as a serious complication; the 3 patients in whom it was present all died. The presence of abnormal substances, such as acetone, or acetoacetic and oxybutyric acids, and an increase in the amount of ammonia excreted, are of the utmost value, and if unreduced by treatment render prognosis most unfavorable. Various experimenters have shown that sugar diminishes the virulence of microorganisms but increases their pus-producing properties. Nerve degeneration must also be taken into account when deciding the question of operation in the presence

of diabetes. Phillips presents the following rules regarding operation: "A thorough examination of the urine must be made in all cases. Not only the amount of sugar is to be ascertained, but the presence or absence of acetone or acid bodies; the ferric chlorid reaction and Lugol's test should be employed in every instance. The presence of oxybutyric acid is not easy to demonstrate or to estimate save by the polarimeter. The total amount of ammonia must always be estimated. No operation save of the extremest urgency is to be performed if there is over 1 gram of ammonia excreted in the 24 hours until this has been reduced to the normal amount. An operation should be postponed if there be acetoacetic acid in the urine, though the ammonia be not markedly increased. Much albumin in the urine is a bar to operation. If serious disease of other organs such as the liver be present, an operation should be avoided. Rapid wasting in a stout diabetic not obviously dependent on the surgical lesion demanding treatment should be a reason for postponing an operation until the general condition is improved. An operation should be performed: (1) for malignant disease, if apart from diabetes such would be urged; (2) in the case of large abdominal tumors, especially in females; (3) in diabetics in good health without extensive arterial or nerve degeneration cosmetic operations may be performed, especially in females; and (4) an emergency operation is to be undertaken even in the most unfavorable circumstances, but a very guarded prognosis is to be given. Save in the last category, if any of the indications against operation be present the operation should be postponed until they are ameliorated." Preliminary treatment should be instituted in all cases where it is possible. If ammonia is present in excess, bicarbonate of sodium should be administered until the percentage becomes normal; if it produces vomiting, it may be administered per rectum. By preliminary treatment the risk of coma and sepsis is lessened. When it is possible, local anesthesia should be employed rather than general. The value of this is shown by Legendre's success in operating for cataract. Ether may be preferred to chloroform, and when possible an aseptic to an antiseptic operation. The patient should not be considered cured until the wound is completely healed. Stress is finally laid upon the value of the administration of bicarbonate of sodium several days before operation.

The indications for operation in calculus nephritis and ureteritis are presented by C. L. Leonard.¹ He refers to the much greater frequency with which the diagnosis of ureteral calculi by the Röntgen method is now made. It is stated that it is possible for ureteral calculi to remain quiescent for some time. The mere presence of a stone in the ureter is no indication for operation, and the author proposes an expectant or conservative plan of treatment in many of these cases when the stone is small. The x-ray has been found as accurate in making negative as positive diagnoses. The symptoms indicating nonoperative treatment are a more or less constant, dull ache in the lumbar region, with recent and repeated attacks of more acute pain, and the presence of a small calculus. There is great likelihood of the subsequent passage of the calculus if the Röntgen

¹ Jour. Am. Med. Assoc., Nov. 30, 1901.

picture shows the kidney to be hydronephrotic. When no infection is present, the employment of all exploratory instruments in the male is to be avoided. The cystoscope, the ureteral catheter, and the segregator are all of value, but their employment in septic cases is still *sub judice*. Except as confirming the condition, urinalysis is of doubtful value. The Röntgen rays will not infrequently demonstrate the presence of phleboliths in the venous plexus of the broad ligament which may be mistaken for ureteral calculi, and in such cases the use of the wax-tipped ureteral catheter is of value. The presence of infection in the female should be considered a positive indication for operation, and complete or unilateral anuria is always an absolute indication for immediate operation. In the male any form of anuria, the presence of calculi too large to pass, accompanied by symptoms indicating serious injury to the kidney, are indications for operation. It is asserted that incision into the kidney for suspected calculus is only justified by the previous detection of the calculus by the Röntgen method, and the definite location of the calculus by this means has greatly diminished the traumatism of both kidney and ureter at the time of operation. In over 50 % of 48 cases in which calculi were found the stone was lodged in the ureter. Before operating for small ureteral calculi the bladder should be thoroughly examined with a Bigelow evacuator.

Donald MacRae¹ discusses the subject of **kidney stone**, paying particular attention to the **diagnosis** and **treatment**. The author refers to the frequency with which mistakes are made in the diagnosis of renal calculus. Kelly's waxed ureteral bougie and the Harris segregator have done much to aid diagnosis. The x-ray in the hands of a competent man has been so perfected as to be a most reliable diagnostic measure. The author states that he believes the time has arrived when it is the surgeon's duty to subject each and every case of an affection pointing to a pathologic nephro-ureteral condition to the x-ray.

Edmund Owen² makes some clinical remarks upon **3 cases of operation for suspected stone in the kidney**, in 2 of which the stone was found and removed. In none of the cases was hematuria present as a symptom. It is a mistake to allow the absence of this symptom to be a contraindication to operation. Owen does not favor the employment of the x-ray as a diagnostic measure, particularly in doubtful cases. He states that the negative results of an x-ray search for a supposed renal calculus may result in a disaster, and that he never advises the patient to run the risk of inviting it. The symptoms of hematuria and pain will depend to a large extent upon the size and shape of the stone. If this is small and lies in the pelvis of the kidney, it is apt to give rise to bleeding and neuralgia, whereas if it is large and fixed these symptoms are not so marked. Describing the operation, Owen states that a most essential feature is an incision which will thoroughly expose the organ, which should then be carefully palpated. He has ceased to employ "needling" of the kidney in the search for a stone. Incision into the pelvis is to be avoided, since a urinary fistula is apt to be the result. The best incision for the discovery and removal of a stone is through the kidney cortex.

¹ Amer. Med., Oct. 12, 1901.

² Lancet, April 19, 1902.

Thorndike¹ discusses the **value of the x-ray in the diagnosis of renal stone**, and reports 4 cases, in all of which renal stones were believed to be present and skiagraphs were taken for confirmatory evidence. In 3 of the cases the stones were found, but in the fourth case a hydro-nephrosis was met, due probably to sagging of the kidney. In the 3 cases in which stones were found the skiagrapher felt certain of his interpretation of the shadows on the plates, but in the fourth case, where subsequently no stone was found, he was in doubt.

Sir William H. Bennett² discusses **renal calculus** in a clinical lecture, taking as the basis of his remarks 3 cases upon which he operated. Each of these cases goes to show the difficulty sometimes to be met with in making a differential diagnosis in renal disease. The author speaks of the negative evidence of the x-ray as being practically valueless. Great stress is laid upon the importance of carefully examining the urine in cases of supposed renal calculus in order to eliminate bladder symptoms which may possibly be due to a phosphatic urine. [American surgeons are inclined to attach much more value to the findings of the x-ray than is Sir William Bennett. We feel that the work of Leonard, Beck, Sweet, Bevan, and others has proved beyond doubt that the x-ray should always be employed not only to corroborate a diagnosis of renal calculus, but to make sure that there is not more than one stone in the kidney or ureter. It is true that renal stones have been discovered by operation that were not previously indicated in the skiagraphs taken, but it is equally true that a fruitless search has been made for stones which later were definitely located by means of the x-ray. Every skiagraph cannot be looked upon as absolutely accurate, yet we feel that it is a valuable aid in the diagnosis of renal and ureteral calculi. Of course, if the symptoms strongly point to stone an exploratory operation is justifiable even if the x-ray shows no calculus. Skiagraphs in such cases, to be reliable, must be taken by an expert.]

Kolischer and Schmidt³ describe a **new method of skiagraphic diagnosis for renal and ureteral surgery** which consists in passing through the ureter and into the renal pelvis a very soft flexible wire made of lead blended with antimony. These wire sounds are soft and their surface polished to a perfect smoothness, so that injury to the lining membrane of the renal pelvis and ureter is not to be expected. The sound is introduced and a skiagraph taken while it remains in position. The authors' article is accompanied by a number of skiagraphic cuts showing the wire sounds in position. They believe that this method will prove of great value in the diagnosis of ureteral and renal conditions.

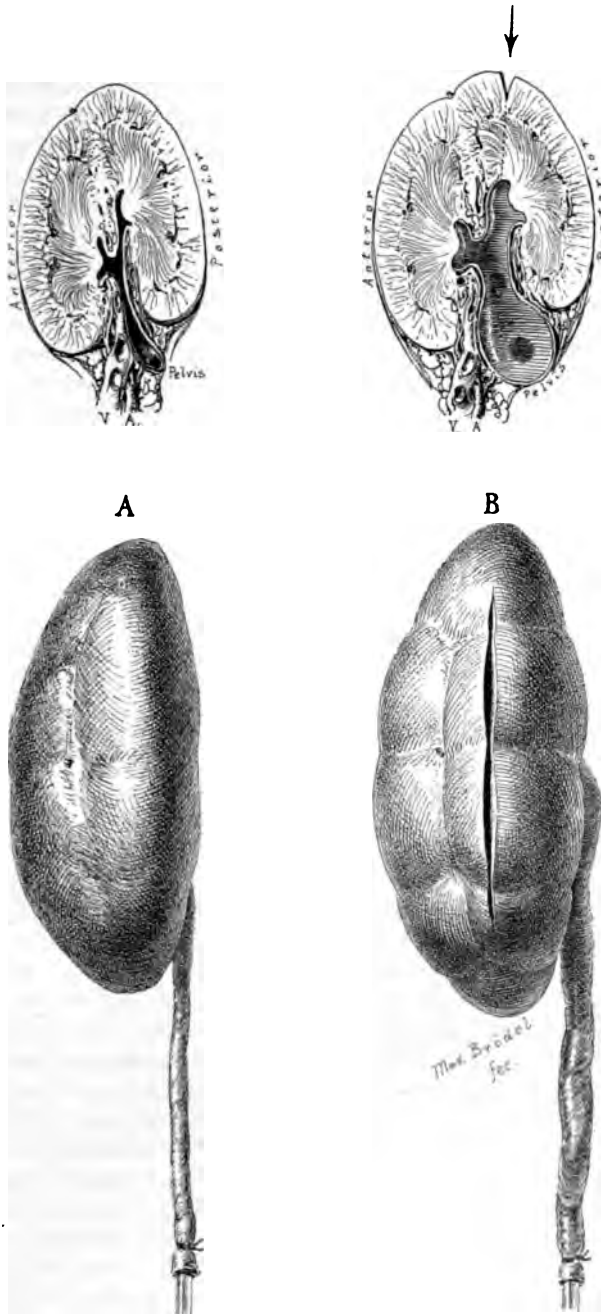
Keen⁴ reports an interesting case of **ureteral calculus accurately located by the x-ray** and removed by an **extraperitoneal operation**. The patient was a boy 10 years of age who suffered from typical attacks of renal colic. A skiagraph by Leonard showed the stone lodged just below the true pelvic brim. The calculus had ulcerated its way through

¹ Boston M. and S. Jour., Oct. 17, 1901. ² Phila. Med. Jour., Feb. 22, 1902.

³ Jour. Am. Med. Assoc., Nov. 9, 1901.

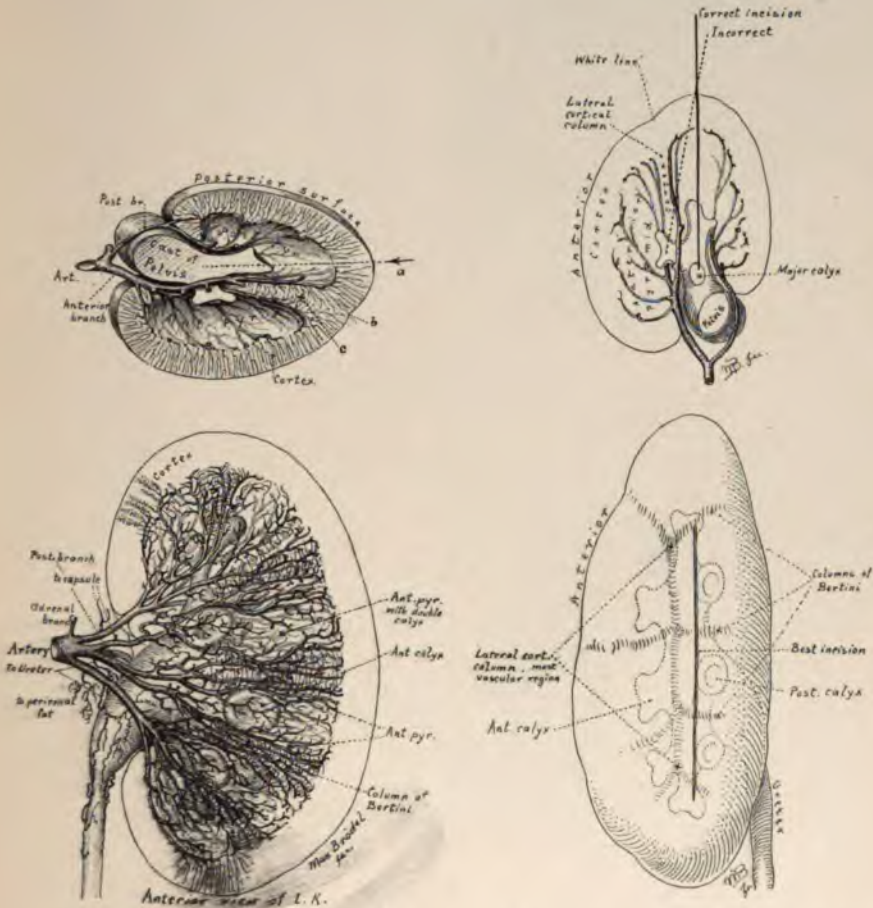
⁴ Jour. Am. Med. Assoc., Aug. 31, 1901.

PLATE 1.



A shows a kidney viewed from the lateral border. The pelvis is in its normal state of collapse, as is shown also in the cross-section drawn above. The pelvis and infundibula are seen as a comparatively narrow slit in the center of the organ. It is easy to see how difficult it is at times to direct the incision properly and not nip off the papillas of the posterior pyramids. *B* shows the same kidney with its pelvis in state of distention. The lobules are much more clearly visible, and the palpating hand feels with ease the various pockets of the pelvis as they fill themselves with the fluid, the diagram above demonstrating the other merits of this distention. It produces: (1) A theoretic reduction of the thickness of the parenchyma; (2) a separation of the two vascular systems of the kidney, facilitating considerably (3) the finding of the least vascular plane of the kidney; (4) a temporary reduction of the amount of blood in the kidney; as all the large veins are in immediate contact with the pelvis, it is readily seen that a distention of the pelvis must force the greater part of the venous blood out of the kidney; (5) a safeguard against cutting off the papillas of the posterior pyramids, enabling the surgeon to make his incision with the least amount of injury to the secreting structures (H. A. Kelly, in Brit. Med. Jour., Feb. 1, 1902).

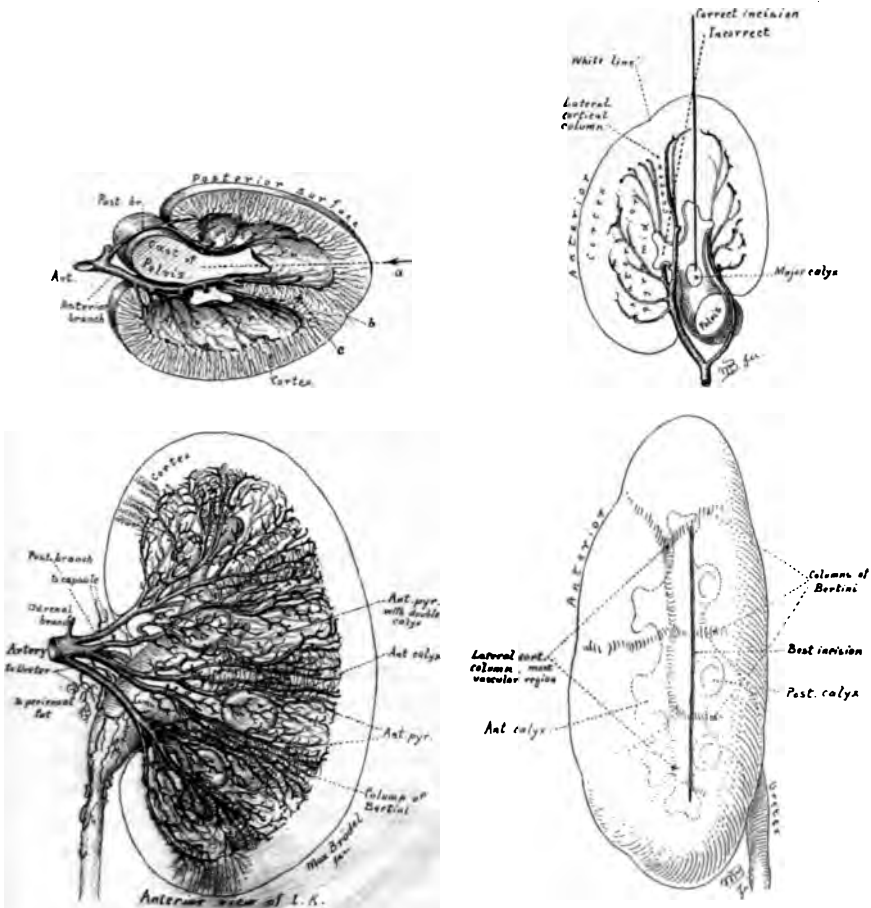
PLATE 2.



The renal artery and the distribution of its branches in relation to the pelvis. The upper diagram represents a transverse section through the middle of a left kidney. The anterior branches of the artery supply about three-fourths of the kidney substance, while the posterior branch supplies only a fourth. The dotted line and arrow indicate the plane of arterial division; *b* shows a depression on the surface of the kidney which marks the border-line between the cortical portions of the anterior and posterior row of pyramids; *c* is a section of the longitudinal column of cortical substance in which the great majority of the renal vessels pass. The lower figure is drawn from a corrosion specimen. The vessels of the cortex have been omitted for the sake of clearness (H. A. Kelly, in Brit. Med. Jour., Feb. 1, 1902).

Section and lateral view of a kidney indicating the method of determining upon the most advantageous incision through the parenchyma. This method is safe in all cases where the majority of blood-vessels can be palpated as passing anteriorly to the pelvis and where the longitudinal white line is in its usual position (H. A. Kelly, in Brit. Med. Jour., Feb. 1, 1902).

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the posterior wall of the ureter and had matted together the rectum and ureter and lay in a pouch which was partly intraureteral and partly extraureteral. The opening into the ureter was closed with catgut sutures, gauze packing was introduced, and the external wound closed. The patient made a good recovery.

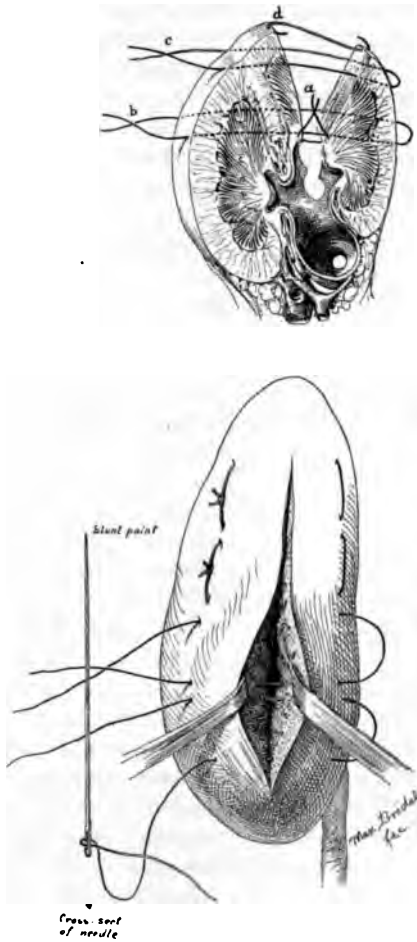
Howard A. Kelly¹ discusses the **best method of incising, searching, and suturing the kidney**, taking as a basis for this study the anatomy of the organ. The author states that the x-ray has to a large extent superseded the use of the wax-tipped ureteral catheter. The latter instrument, however, remains of great value in diagnosing the exact location of a ureteral stone. Kelly describes the irrigation of the pelvis of the kidney through the ureteral catheter, and urges this as a preliminary to operation upon the renal pelvis. He also advocates the distention of the kidney with fluid through the ureteral catheter after its exposure through a lumbar incision. Such distention of the kidney indicates to the surgeon the most favorable point at which to make his incision into the organ. The practical results of the anatomic studies of Max Brödel are well illustrated in Plates 1, 2, and 3. Brödel's researches have developed the important fact that the vascularization of most kidneys is provided with two arterial systems which are completely separated by the renal pelvis. There is a major system carrying three-fourths of the arterial blood provided for the anterior and a part of the posterior half of the kidney, and a minor system carrying one-fourth of the arterial blood provided for the remaining posterior portion. In order to avoid the loss of blood the surgeon should make his incision in the line which divides these completely separated systems. The more the pelvis and calices are distended by fluid injected through the ureteral catheter, the further are the two vascular systems separated. The white longitudinal line which is noticed in the distended kidney Kelly proposes to call Brödel's white line. This is well shown in Plate 2. The best place to incise the kidney is through the lateral portion of the posterior pyramids between the anterior and posterior vascular trees. The incision should pass parallel to the longitudinal white line 1 cm. away from it and on the same side of the kidney where the palpating finger feels the lesser number of vessels, in the majority of cases on the posterior surface, but occasionally anteriorly. Kelly does not think it wise to try to remove a stone directly through the pelvis of the kidney, preferring to incise the renal tissue. Kelly's method of suturing the kidney is shown in Plate 3.

J. W. Bovée² discusses **nephroureterectomy**, reporting 2 cases. The principal indication for nephroureterectomy is tuberculous disease of both these structures. It is difficult to determine to what degree tuberculous disease has descended along the ureter, therefore the removal of a large portion or all of the duct is advisable. Often in calculous pyonephrosis the ureter is partially or completely obstructed and the

¹ Brit. Med. Jour., Feb. 1, 1902.

² Virginia Med. Semi-Monthly, Dec. 27, 1901.

PLATE 3.



Method of approximating the two cut surfaces. A glance at Plate 2 shows why simple interrupted sutures almost always tear, because they are placed in the same plane with the large vessels, which form the strongest framework the kidney possesses. Plate 2 also shows why mattress sutures are best adapted for uniting the two cut surfaces—because they pass at right angles or nearly so to the large vessels, preventing effectively any tearing of kidney substance. They are passed through the parenchyma near the pelvis because most of the venous oozing is to be expected from that region; *a*, catgut sutures approximating pelvis (can be dispensed with); *b*, deep catgut mattress sutures passing as much as possible through cortical substance, avoiding the pyramids. They are best placed with a long straight three-cornered needle with blunt point in order to avoid injury to large vessels. The needle should not be thrust or forced through the kidney, but its blunt point should be allowed to feel its way through the parenchyma, avoiding all structures that offer greater resistance than the safe cortical substance; *c*, is a second system of mattress sutures which may be dispensed with, if the first row of deep sutures produces the desired effect; *d*, is the usual suture of the capsule (H. A. Kelly, in Brit. Med. Jour., Feb. 1, 1902).

operated upon and a supposed abscess of the kidney drained. Three years after this operation the patient again suffered pain in the neighborhood of the former operation, the result of an abscess, which was drained by another surgeon. A few months later the patient was suffering so much that Munro undertook to do a nephrectomy, but when the incision was made the condition illustrated in the accompanying illustration (Fig. 35) was found. The dilated ureter was resected and the patient made a perfectly satisfactory recovery.

J. Henry Barbat,¹ after referring to the great advancement made recently in the diagnosis and treatment of renal and ureteral conditions, reports some most interesting experiments upon dogs in which he has endeavored to **use a portion of the small intestine to bridge over the gap left after resection of the ureter.** It was his custom to select a portion of ileum, from which he excised a piece without disturbing its mesenteric attachment; the caliber of the remaining intestine was reestablished with a Murphy button. He thoroughly irrigated the excised portion with a 1 : 1000 formalin solution, and then firmly fixed the proximal end of the ureter in one end of the piece of the intestine and the other end of the intestine was inserted into the bladder. Three such operations were performed. The result was perfect in two; in the third case the dog died 5 weeks after operation of an ascending infection, due, the author thinks, to his not having thoroughly cleansed the portion of the bowel used. The bowel was not removed for 3 months from one dog and not for 6 months from another. In one case both ureters were implanted into a loop of bowel which was attached to the bladder by a lateral anastomosis. This dog died, however, from an overdose of strychnin. In another case the entire bladder was removed and a portion of bowel substituted for it; this dog died with an enormously distended new bladder and some slight leakage at the urethral attachment. The author believes that if catheterization had been possible this death might have been prevented.

J. W. Bovée² discusses at some length the various methods of **ureteral anastomosis**, and reports a case in which, after resecting 1 inch of the ureter, he performed a successful end-to-end anastomosis. Twelve such operations have been performed with 2 deaths, neither of which, however, could be attributed to the operation. The author refers to another patient in whom he performed an oblique end-to-end anastomosis 5 years previously, and who at present is in perfect health. There have been reported 33 cases in which the severed ureter has been united and in which there followed no ureteral incompetency. Bovée is an advocate of the end-to-end method.

Guinard³ reports a case in which in performing a difficult hysterectomy he accidentally resected a portion of the left ureter. It was found impossible to anastomose the two ends of the ureter or to attach the upper end to the bladder; the **ureter** was therefore **anastomosed to the sigmoid flexure.** The patient recovered, and after 8 months was

¹ Jour. Am. Med. Assoc., Aug. 3, 1901. ² Jour. Am. Med. Assoc., July 27, 1901.

³ Bull. et Mém. de la Soc. de Chir., No. 19, 1901.

in good health, the bowels moving but once a day, and there being no evidence of any tendency to occlusion of the ureterointestinal fistula or of infection of the kidney.

An interesting case of **ureteral anastomosis by the vagina** is reported by Wm. K. Turner.¹ The patient was operated upon for complete prolapse of the uterus and bladder. The cervix was greatly hypertrophied and eroded. The uterus and bladder both protruded beyond the vulval orifice. For the relief of these conditions a vaginal hysterectomy was performed, during which the left ureter was accidentally divided about 2 inches from the bladder. In attempting to anastomose the ends of the ureter by the Van Hook method the proximal portion of the ureter was split for a distance of about 1 inch. This accident interfered with the completion of the Van Hook operation, and after discussing the propriety of opening the abdomen Turner determined to reverse the operation of Robinson by implanting the lower segment of the ureter into the upper; this was accomplished without much difficulty and the patient made a satisfactory recovery, leaving the hospital 5 weeks after the operation. At no time during the convalescence was there any leakage. In a review of the literature of the subject Turner has been able to find no other case reported in which the ureter has been anastomosed through the vagina. He doubts its practicability in most instances; in his own case it was much facilitated by the prolapse of the bladder.

DISEASES OF THE PENIS, URETHRA, TESTICLE, ETC.

G. M. Blech² reports a case of **sterility in the male** due to dead spermatozoa; recovery followed the application of galvanism to the prostatic urethra.

Carl Beck³ puts on record a case of **double penis** associated with exstrophy of the bladder which shows 4 ureteral orifices. This is the third case of this character in literature.

Henry H. Morton⁴ thinks that, next to age, phimosis is the most important predisposing cause of **cancer of the penis**. Demarquay finds that of 59 cases of epithelioma of the penis, phimosis existed in 42. Cancer is also said to be rare among Jews. Any form of chronic irritation is apt to cause an inflammation which may develop into cancer. The growth rapidly ulcerates and arranges itself in cauliflower-like projections. The inguinal glands are usually swollen from a mixed infection of carcinoma cells and pyogenic bacteria. Any warty growth or chronic ulceration in an old person should be looked upon with the greatest suspicion and malignant disease eliminated or confirmed by microscopic examination. Death occurs in from 1 to 2 years in the cases which are not subjected to operation. In complete amputation of the penis, Morton splits the scrotum and exposes the corpus spongiosum as far as the triangular ligament. The corpus spongiosum

¹ Ann. of Surg., Dec., 1901.

² Phila. Med. Jour., Dec. 7, 1901.

³ Med. News, Sept. 21, 1901.

⁴ Jour. Am. Med. Assoc., Feb. 22, 1902.

and urethra are dissected away from the corpora cavernosa for 3 inches and allowed to hang from the wound while the corpora cavernosa are separated from the pubic rami by the Paquelin cautery. The urethra is stitched to the margins of the skin and a catheter is tied in the bladder. Castration may be performed to quell the sexual desire. Wide extirpation of the inguinal glands should be practised.

H. Hartmann¹ writes on the **treatment of foreign bodies in the urethra**. "In some cases it is possible to remove the foreign body, such as a calculus, by forcible micturition when the meatus is closed. If the foreign body is at the prostate, it would be unwise to attempt extraction through the anterior urethra, as there is great probability of tearing the membranous portion. In such a case it is usually possible to force the foreign body into the bladder, from which it may later be removed. In some of these cases where it is immovable, it may be grasped by a urethral lithotrite and crushed. If the foreign body rests in the anterior fossa of the urethra and it is regular in outline, it is removed with difficulty. If it is too large to pass the anterior meatus, the latter should be freely divided and the foreign body seized with the forceps and removed. For the purpose of the removal of foreign bodies Collin's forceps are useful. These have a long, slender shank (Fig. 36), and can be closed until they are in contact with the foreign body, as shown in Fig. 37, when they can be opened. If they are not actually in contact with the foreign body as the forceps are opened, it is certain that the urethra will be torn (Fig. 38.) An excellent instrument known as the bascule curet (Fig. 39) fills an important place in the removal of foreign bodies. This can be introduced closed, and passed to the side of the obstruction. When posterior to it, the instrument is opened (Fig. 40). The possibility of tearing the mucous membrane with this instrument was recognized by Guyon, who, in addition, inserted a bougie of wax, which was passed down on the foreign body after the curet was in position. This separates the walls of the urethra and dilates the canal sufficiently for the passage of the foreign body (Fig. 41). In cases of a pin with a head which is engaged in the urethra, the point is always in the direction of the urethra. In such cases all that is necessary is to force the pin through the urethra and out through the skin. The point of the pin is then carried backward toward the bladder, which causes the head of the pin to present toward the front. It can then be grasped with the forceps and removed the same as a round foreign body having no sharp point."

Berard and Trillat² report 3 cases of **urethral tuberculosis** occurring in the male. One followed a tuberculous cystitis, the other two followed tuberculous epididymitis.

E. L. Robinson³ reports a case of **rupture of the urethra** associated with separation of the pubic bones and probably laceration of the sacro-iliac joints, as there was loss of power over the sphincter ani and partial paralysis of the lower extremities. The injury was caused by violent

¹ La Presse Méd., July 24, 1901; abstracted in Medicine, Oct., 1901.

² Bull. Méd., Aug. 21, 1901.

³ Brit. Med. Jour., Feb. 1, 1902.

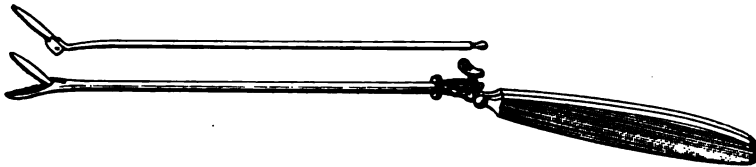


Fig. 36.—Collin's forceps.

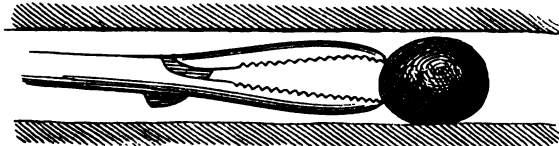


Fig. 37.—Forceps brought in contact with the foreign body before the blades are separated.

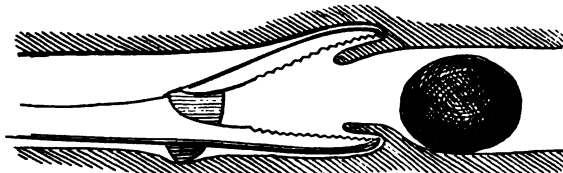


Fig. 38.—Effect of opening the jaws of the forceps before actual contact with the foreign body; the mucous membrane is certain to be included in their grasp.

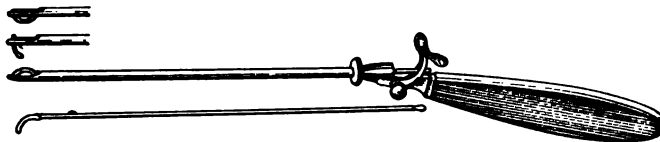


Fig. 39.—Bascule curet.

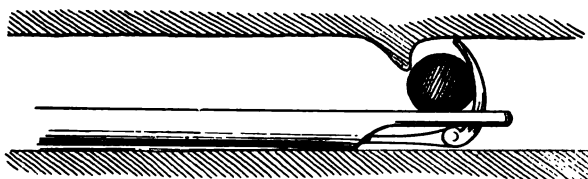
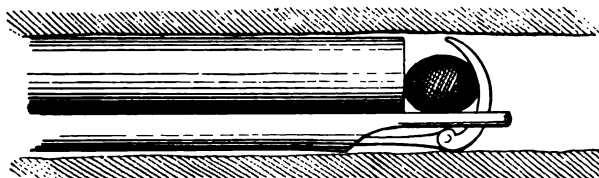


Fig. 40.—The bascule curet opened behind the foreign body.

Fig. 41.—Wax bougie passed along the shank of the instrument, separating the walls of the urethra.
(Hartmann, in *La Presse Méd.*, July 24, 1901, and *Medicine*, Oct., 1901).

jolting while riding a recalcitrant horse bareback. Complete recovery took place, liberal incisions being made for drainage of extravasated urine.

James R. Hayden¹ reports 3 cases of **rupture of the urethra**, of which 2 were treated by external urethrotomy and the third by rest and irrigations. He states that the treatment is either operative or nonoperative, according to the nature and extent of the injury. If there is marked hemorrhage from the meatus with complete retention of the urine, or painful and bloody micturition associated with great difficulty or absolute inability to enter the bladder with instruments, or if there be signs of extravasation of urine into the scrotum or perineum, immediate perineal section and drainage of the bladder are indicated. If urination is free, the urine only slightly stained with blood, catheterization easy, and no perineal swelling, then rest in bed with bladder irrigations and urinary antiseptics are called for. Partial suture of the urethra must always be employed in cases of complete rupture in which the divided ends of the canal are widely separated. Complete suture is contraindicated, as it precludes free urethral and bladder drainage.

Rey² declares **against indiscriminate circumcision**, and states that cystitis should be considered a most positive contraindication to operation. Failure of a ready retraction of the prepuce in early childhood does not indicate that the operation is necessary; as the child grows older the opening enlarges and retraction becomes possible. Rey maintains that in a cystitis the prepuce acts as a protection to the glans, and that when it is removed a troublesome intertrigo results. Cystitis in early life is often overlooked. The indications of a cystitis are an ammoniaical odor and reddish stains on the napkin. Except when required for congenital malformation, circumcision should not be practised until after the fourth year.

J. P. zum Busch³ reports 4 cases of **elephantiasis of the external genitals** following the removal of the inguinal glands for bubo; 3 cases occurred in males and 1 in a female. The whole infected area of lymphatic glands should not be removed except as a last resort in otherwise incurable cases of bubo in which suppuration will probably destroy all the glands. In one of the cases a portion of the hypertrophied tissue was removed. It is suggested that an operation somewhat similar to that performed by Godlee on a case of obstruction of the thoracic duct might be employed. Godlee anastomosed one of the dilated lymphatic vessels with the saphenous vein, with a result that the varicose lymph-vessels subsided.

A. B. Atherton⁴ details the history of a case of **torsion of the spermatic cord** occurring in a boy aged 14 years. The patient complained of a painful swelling in the left groin following a jumping contest. A diagnosis of strangulated hernia had been made and efforts at reduction attempted. At operation the cord was found twisted twice on itself and the testicle gangrenous. Castration with removal of the cord was performed.

¹ Med. Rec., Nov. 23, 1901.

³ Lancet, Mar. 8, 1902.

² Jarhb. f. Kinderheilk., June, 1901.

⁴ Med. Rec., Nov. 23, 1901.

Lewis C. Boshier¹ gives the histories of 4 cases of **sarcoma of the testicle** occurring at the ages of 24, 37, 32, and 52 years respectively. One patient gave a history of trauma, 3 of repeated attacks of gonorrhea with epididymitis. According to Gurlt, of 16,637 tumors occurring in the Vienna hospitals, 11,131 were carcinomas and 848 sarcomas; of these, 64 were carcinomas of the testicles and 45 sarcomas. Trauma bears a distinct relation to the disease and gonorrheal epididymitis is a frequent forerunner. Undescended testicles are especially liable to sarcoma. Although both organs may be involved, the condition is usually unilateral. The growth is painless until its size causes a dragging sensation in the scrotum or until the tunica albuginea is invaded, when the pain becomes acute. The rapidity of growth varies with the size of the cell, being rapid in the small-celled variety and slower in the spindle-celled tumors. The iliac and lumbar glands are involved early. The veins of the scrotum enlarge, there may be edema of the lower extremities, and cachexia appears as a late symptom. The following structures should be removed at operation: the testicle with its coverings, including that portion of the scrotum which covers it and the raphe, the spermatic cord, the inguinal glands, and all fat.

Chas. L. Scudder² deals with the question of **strangulation of the testis by torsion of the cord**, and presents brief notes of all the reported cases, 32 in number. In each case operated upon some abnormal condition of the testicle was found, and in all of the cases the testicle could be moved freely within the tunica vaginalis, and in a few instances the tunic was found to extend for some distance up the cord. In 47 % of the cases the testicle was undescended, being found within the inguinal canal or but partly descended. In every case there was a long mesorchium. A normal testicle properly placed cannot easily become strangulated from a twist of the cord. The real cause of the twist in the reported cases is unexplained, although the long mesorchium would suggest a cause. The various theories regarding the cause of the twisting are reviewed. The testicle in the cases recorded was found swollen and very much darker in color; parenchymatous hemorrhage or gangrene was present. The vaginal process contained blood-clot and serum. The condition of the testicle upon section varies; hemorrhagic infarction or interlobular hemorrhage may be found. The condition closely resembles strangulated hernia in its symptoms; these may be described as sudden pain, vomiting, tumor in the groin or scrotum, a moderate degree of shock, and a chill. The condition has been mistaken for a periorchitis and a ruptured varicocele. There is usually no obstruction of the bowels and the constitutional symptoms are not so severe as in strangulated hernia. If the condition is complicated by a hernia, diagnosis is rendered very difficult. In 16 % of the cases recorded a hernia was present on the same side as the torsion of the cord; in 88 % of the cases the testicle became gangrenous. In 25 cases primary orchidectomy was done for gangrene; in 7 cases no operation was done and subsequent sloughing of the testis occurred in 3 cases; in 2 cases not operated upon

¹ Virginia Med. Semi-Monthly, Jan. 24, 1902.
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² Ann. of Surg., Aug., 1901.

subsequent atrophy occurred. All of the 32 cases recovered. If the case is seen early,—that is, within an hour after the twist has occurred,—and a diagnosis can be made, untwisting may be tried; but if the patient is not seen within the first hour and the symptoms have been marked, orchidectomy is indicated.

H. C. Sharp¹ suggests **severing the vasa deferentia** in all inmates of prisons, almshouses, reformatories, insane asylums, and institutes for feeble-minded in order to prevent propagation by such individuals. He has performed the operation 42 times.

Orville Horwitz² presents an analysis of 96 operations for the **relief of tuberculosis of the testicle**. He draws the following conclusions: “(1) A primary tuberculous infection of either the epididymis or testicle may occur, the former being by far the more common. (2) A primary infection of the epididymis, secondarily that of the testicle, is more common than the descending one. (3) Primary involvement of either the epididymis or testicle usually takes place through the circulation, the soil being predisposed to the location of the tubercle bacilli either by a slight traumatism or by some infective condition which has given rise to inflammation of the organ, most commonly an attack of gonorrhea. (4) Secondary tuberculous involvement of the epididymis or testicle sometimes follows a primary focus of the disease in other portions of the body, more commonly in those organs that are in a direct anatomic connection with the sexual glands, such as the seminal vesicles, prostate, urethra, bladder, ureter, or kidney. (5) The invasion of the testicle may be rapid, associated with acute inflammatory symptoms, an abscess soon developing; or the onset may be slow, the symptoms simulating those of either chronic syphilitic orchitis, or malignant disease of the organ. (6) The tuberculin test should always be employed in doubtful cases where only one focus of the disease is known to exist. (7) In doubtful cases associated with hydrocele, the fluid should be examined for the tubercle bacilli and inoculating experiments made. (8) The injections of either emulsions of iodoform or of sulfate of zinc into the diseased part are not to be recommended. (9) In all cases of encapsulated caseous nodules quiescent in the epididymis, epididymectomy should be performed. (10) Epididymectomy together with resection of the vas deferens is not attended by either atrophy of the testicle or sexual weakness. (11) The drainage of tubercular abscesses followed by the use of the curet is only to be employed where radical treatment is not permissible, as it is attended with more or less danger and is generally unsatisfactory in its results. (12) In instances where the epididymis alone is involved, a resection of the diseased structure is all that is required; whether a partial or complete resection of the vas deferens is to be undertaken is still undetermined. (13) Double orchidectomy should be performed when both glands are diseased, provided there is not extensive coexisting tuberculous infection of other organs. (14) Whether infected seminal vesicles should always be removed at the time that the epididymis or testicle is resected is a question open for

¹ N. Y. Med. Jour., Mar. 8, 1902.

² Jour. Am. Med. Assoc., June 21, 1902.

discussion. From the fact that in a large majority of cases the removal of the primary seat of the disease is followed by a subsidence of the tubercular involvement of the vesicles, it is deemed wiser, as a rule, to wait and remove the vesicles later, if necessary. (15) Hygienic and climatic influences play as important parts after operations in fortifying the constitution against further invasion as they do in other tubercular conditions. (16) The anti-tuberculous remedies are of great value in controlling the disease, and should always be employed in conjunction with whatever surgical procedure may be deemed necessary."

Von Bruns¹ gives the results of a study of the cases of **tuberculosis of the testicle** occurring in the clinic in Tübingen during the past 50 years. Epididymectomy is the operation of choice when the epididymis is the only part involved. Double castration is not justifiable because when both testicles are diseased the upper portions of the seminal tract are invaded and because of the depressing effect on the individual. Of 111 cases, 78 were subjected to unilateral castration and 33 to bilateral castration. The disease had extended from the epididymis to the testicle in 2 months in 18 %, in 3 months in 24 %, in 6 months in 40 %, and in 40 % the testicle became diseased after 6 months. In 38 % both organs were diseased, and of these in 23 % the second testicle became infected after the primarily diseased organ had been excised. Of the unilateral castrations, 12 % died of genitourinary tuberculosis, and 15 % of tuberculosis in some other portion of the body, while 46 % were cured in periods varying from 3 to 34 years. Of those cases in which both organs had been removed, 15 % died of genitourinary tuberculosis, 25 % of tuberculosis in other portions of the body, and 56 % recovered and remained well at the end of from 3 to 30 years.

J. F. Hodgson² reports a case which he believes to be that of **primary tuberculosis of the seminal vesicles** in which he performed the operation of excision. The patient was 32 years of age and presented the following symptoms: Frequency of micturition, dysuria, pain in the perineum, and occasional hematuria. Tubercle bacilli were present in the urine. Both vesicles were removed through a transverse perineal incision. Three months subsequent to the operation the right epididymis became enlarged.

H. H. Young³ publishes 2 cases of extensive **genital tuberculosis** in which he excised the testicles, the vasa deferentia, the seminal vesicles, and a portion of the prostate by what he terms the "suprapubic, retrocystic, extraperitoneal method." One patient died of exhaustion on the eighteenth day and the other perished 4 months after operation from generalized tuberculosis. The method is as follows: A median incision is made from about $\frac{1}{2}$ inch above the umbilicus to the pubes, and a second incision severs the recti transversely at the upper end of the longitudinal cut. The peritoneum is separated from the bladder as far as the vasa deferentia and the bladder is opened and the ureters catheterized to identify them during the subsequent operative manipu-

¹ Arch. f. klin. Chir., Bd. LXIII, Heft 4.

² Brit. Med. Jour., Nov. 16, 1901.

³ Ann. of Surg., Nov., 1901.

lations. The vasa and vesicles are separated by blunt dissection and removed with a portion of the prostate. The skin at the lower end of the incision is undermined, the testicles drawn up out of the scrotum and removed in one piece with the vasa deferentia. The bladder is sutured and a small drain left in the lower end of the incision in the abdominal wall. The seminal vesicle may be approached by the inguinal method (Villeneuve, Zuckerkandl by Ullmann, Roux), in which the vas is followed through the inguinal canal until the vesicle is reached, when both are excised, and they may also be attacked through the perineum (von Dittel by Schede, Guelliot, Baudet, and others) and through the sacrum (Kraske by Schede, Rydygier). The operation of vesiculectomy for tuberculosis has been performed 34 times. Of the 20 patients that were followed for periods varying from 3 weeks to 8 years, 5 died, in 5 the condition recurred, and 10 recovered. Young writes: "I am free to confess that this study of the literature has completely changed my views upon the subject, and I do not now feel satisfied as to the advisability of attacking tuberculous vesicles." Young advises epididymectomy in suitable cases and castration when the epididymis and testicle are extensively diseased, when the process is limited to one side; when the condition is bilateral, castration should be performed on the worst side, and an effort made to preserve some portion of the testicle on the other side, even if there be some risk of local recurrence. Operation on the seminal vesicles and prostate should only be done after removal of the testicular foci has failed to arrest the progress of the disease in these organs and it has spread to the bladder. Serious involvement of distant parts does not contraindicate operation, especially since the more exact methods of using cocain have rendered general anesthesia unnecessary. That remarkable disappearance of extensive tuberculosis of the prostate, seminal vesicles, bladder, kidneys, lungs, etc., may follow the simple removal of the testicular foci seems abundantly proved.

J. L. Firth¹ reports a case of **bilocular intrapelvic and scrotal hydrocele**. The patient was a laborer aged 20 years who had had a swelling in the left scrotum since infancy. The swelling could be reduced, was translucent, and transmitted a wave of fluctuation to the hand as high as 5 inches above the pubis. At operation a large extraperitoneal sac was found communicating with the scrotal hydrocele; the intrapelvic portion of the hydrocele was enucleated.

W. B. Coley and P. A. Satterwhite² treat **hydrocele in infants** by applications of equal parts of tincture of iodine and belladonna. Occasionally when the hydrocele is very large the fluid is aspirated and the tunic irritated with the point of the trocar. In the adult the writers employ 2 or 3 minim injections of carbolic acid. The failure to secure a cure by this method is often the result of using a too dilute solution. The so-called 95 % carbolic acid as sold in the shops is usually much below this strength, and is too weak to give efficient results. It is of the greatest importance completely to empty the sac. For this purpose the authors employ a double cannula, the inner projecting slightly beyond

¹ Brit. Med. Jour., Nov. 16, 1901.

² N. Y. Med. Jour., Mar. 29, 1902.

the outer. While the injection method will cure the great majority of cases of hydrocele, there will always be a small number in which the open operation will be demanded. Of all the open methods yet devised, the method of von Bergmann, resection of the superficial tunica vaginalis, seems the best and the most surgical. Among the disadvantages of the inversion method may be mentioned the danger of sloughing of the twisted and poorly nourished sac.

F. J. Cotton¹ claims that all gum-elastic catheters, bougies, and filiform bougies may be boiled repeatedly and for long periods in a saturated solution of ammoniac sulfate or sodic chlorid without essential damage. Formalin sterilization does no great damage, but is unreliable and gives only a surface sterilization at best. Boiling in water almost instantly destroys the resinous coat of these catheters, as does also steam.

W. McAdam Eccles,² in his Hunterian lectures, discusses the question of undescended testicle. The organ may cease its descent within the abdomen in the inguinal canal or just outside of the external abdominal ring. The organ may be ectopic and found in the perineum, Scarpa's triangle, at the root of the penis, and upon the aponeurosis of the external oblique. The causes of the undescendence of the testis are: an unusual length of the mesorchium which permits so free a movement of the organ that it fails to enter the mouth of the vaginal process, or the mesorchium becomes adherent to adjacent structures; the abnormal persistence of the plica vascularis; certain malformations of the testicle and its component parts, such as a short vas deferens and an abnormally large epididymis; certain forms of hermaphroditism; retraction of the cremaster and the absence of the internal fibers of the cremaster before the testicle has reached the inguinal canal; want of development of the inguinal canal, of the superficial abdominal ring, and of the scrotum; and other rare causes, such as the wearing of a truss. There are probably but two causes of ectopic testicle: the gubernaculum may draw the organ into an abnormal position, or it may be pushed into such position by a hernia. The imperfectly descended testicle is usually found to be small and soft, only about 5% of them being of normal size. When examined with the microscope, the tubules are found to be fewer in number and smaller in size than the normal organ and separated from one another by loose connective tissue. Usually neither spermatoblasts nor spermatozoa can be demonstrated. When both testicles are undescended or ectopic, and show a want of development, sterility is indicated. Eccles expresses the doubt that a testicle which had been arrested in its descent but brought down into the scrotum in early youth ever reaches sufficient development to become actively spermatogenic. Although a patient suffering from an arrest of descent of both testes may be incapable of producing spermatozoa, he may yet possess enough virility to copulate. When the testes are undescended and undeveloped, a want of development of the remaining genital organs is noticeable, and there may also be signs of hermaphroditism. Orchitis is much

¹ Boston M. and S. Jour., Mar. 27, 1902.

² Brit. Med. Jour., Mar. 1 and 8, 1902.

more likely to develop in an undescended than in a normal testicle, and usually results in its atrophy. Repeated attacks of orchitis may result in an infection of the peritoneal cavity through the vaginal process. Of the recorded cases of torsion of the spermatic cord, 50 % occurred in undescended testes. Occasionally two cords will be found, one consisting of the vas deferens, and one containing the vessels. Torsion of the cord leads to atrophy or to gangrene. Cystic developments both in the testicle itself and in the epididymis are frequent in undescended testes. Of 38 cases of sarcoma of the testicle, only one was found in an undescended testicle. Carcinoma is uncommon because there is so little active epithelium present in the poorly developed organ. When it does occur, however, its course is rapid. Hydrocele is a frequent complication of undescended testes, and in more than one-half of the cases hernia is present.

DISEASES OF THE BLADDER AND PROSTATE.

Chas. H. Chetwood¹ deals with the surgical treatment of prostatic hypertrophy, quoting the views of the various authorities regarding the time to operate and as to the choice and the extent of the operation. The author describes a galvanocautery incisor which he has devised for operating upon the prostate through a perineal opening. The instrument has interchangeable blades of different sizes like those of the Young instrument. The method of attacking the prostate through the perineal wound with the galvanocautery was first employed by Belfield in 1886. The operation first practised by Chetwood consists in opening the urethra upon a grooved staff and making a careful digital exploration of the bladder to determine the nature and extent of the prostatic growth. The galvanocautery incisor is then introduced and incisions made in the directions indicated by the examination. During the past year Chetwood has operated upon 7 cases by this method. The average age of the patients was 67 years. No death occurred. Five of the cases were complicated with pyelonephritis; 3 were in a serious general condition with signs of urinary septicemia; and in one a renal abscess had existed; 3 patients had almost complete retention of urine, requiring the constant use of the catheter; one had continuous overflow complicated with a calculus, and was compelled to wear a rubber urinal. Chetwood reports each case in detail and reaches the following conclusions regarding the treatment of prostatic hypertrophy: "Palliative measures should not be persisted in when they fail after reasonable trial to produce and maintain an abatement of symptoms. A first infection of the bladder is not alone sufficient excuse for operation unless palliative measures fail promptly to subdue inflammatory conditions. Recurring infection of the bladder or ascending infection of the kidney is sufficient warrant for operative interference. There is a growing tendency toward earlier operation than was formerly practised. The greater number of cases of prostatic hypertrophy can be satisfactorily

¹ N. Y. Med. Jour., May 31, 1902.

reached through a perineal incision. In the large majority of cases the requirements of any operation upon the prostate consist in the removal of the obstructing area and depressing the bladder opening into the prostate, so that the bas fond may be perfectly drained. In many cases the obstructing area of the hypertrophied gland can be satisfactorily reached and effectually removed through a perineal opening by means of galvanocautic incisions."

Parker Sym's¹ is a strong advocate of **prostatectomy by the perineal route**. He has devised an instrument, a cut of which is herewith reproduced (Fig. 42), which materially aids the extirpation of the prostate gland by pressing this structure forward into easy reach of the surgeon's finger. The membranous urethra is opened and the instrument introduced, the rubber bulb at its extremity is then dilated with water to a diameter of $2\frac{1}{2}$ inches. To accomplish this distention $2\frac{1}{2}$ ounces of water are injected by means of a piston syringe. Firm traction is made upon the instrument, which is then turned well up over the perineum and held there by an assistant. Perineal prostatectomy is considered the safest method thus far proposed for the radical cure of prostatic

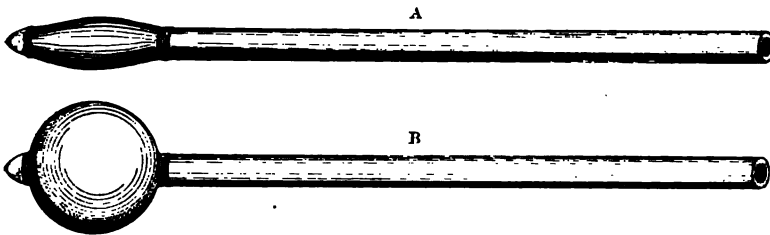


Fig. 42.—Parker Sym's bladder retractor for perineal prostatectomy: A, No. 38 French scale; B, dilated to $2\frac{1}{2}$ inches by water (Ann. of Surg., April, 1902).

hypertrophy, and Sym's urges that the operation should be done early and not left as a last resort.

A. H. Ferguson² reports 6 cases of **median perineal total prostatectomy**. The operation consists in a median incision, exposure of the prostate, splitting of the capsule, and the removal of the whole gland piecemeal. The importance of introducing retractors into the split capsule, thereby not only making a better opening for the removal of the gland but drawing it well down into the field of operation, is referred to. The posterior wall of the prostatic urethra is of course perforated; a drainage-tube surrounded by gauze packing is then introduced and connected by a long rubber tube with a receptacle below the bed. In removing the gland piecemeal the surgeon is enabled to work through a small opening without bruising the surrounding parts; another advantage is that hemorrhage is avoided if the work is done within the capsule. The operation is not a prolonged one and consequently the danger of uremia is lessened. It is also claimed that the shock accompanying this operation is less than that which follows suprapubic prostatectomy.

¹ Ann. of Surg., April, 1902.

² Jour. Am. Med. Assoc., Feb. 22, 1902.

P. J. Freyer¹ discusses the **radical cure of enlargement of the prostate**, stating that until recently partial prostatectomy by the suprapubic route was the most commonly applicable and most satisfactory of all the operations; however, this is an operation which is followed by the loss of the expulsive power of the bladder. This fact, Freyer believes, is due to the remaining lateral lobes which produce pressure upon the urethra. He reports 4 cases in which he has performed total prostatectomy by the suprapubic route with the most satisfactory results, and produces photographs of the organs after removal. After opening the bladder the mucous membrane is divided over the most prominent part of the prostate and the gland enucleated, the lateral lobes being extracted with lithotomy forceps after the urethra has been separated from the gland and the two lateral lobes divided by forcing the finger between them. The finger of one hand is placed in the rectum to push the prostate forward and to support it. In each of the cases reported the growth was an adenoma. When the two lateral lobes are removed separately, the ejaculatory ducts are left uninjured; when the gland is removed as a whole, however, Freyer is uncertain as to the extent of injury done to the ducts. When the gland is removed and its outer capsule left, there is only a small amount of hemorrhage, and this can readily be controlled by hot irrigation. In each of the reported cases the patient was able to retain urine for a number of hours, and it is this feature of the success which makes the operation preferable to other methods.

P. J. Freyer,² in a clinical lecture, describes 4 more cases in which he has performed **total suprapubic prostatectomy**. Of the 8 operations, 7 are described as completely successful in every respect; the remaining patient was making excellent progress when he was seized with acute mania and died. Acute mania is prone to occur in elderly men suffering from advanced prostatic disease whether operated upon or not. The ages of Freyer's 8 patients ranged from 62 to 76 years. The condition of some of them was extremely bad at the time of operation. In 3 of the cases enlargement of the prostate was associated with stone in the bladder; in one case the urethra was torn across at its juncture with the bladder, but there was no bad result. Freyer maintains that the prostate really consists of two distinct and separate encapsulated glandular bodies lying closely approximated one on either side of the urethra and adherent above and below that canal like the segments of an orange. He states that when the gland becomes hypertrophied or adenomatous the adhesions at the commissure give way to some extent and thus facilitate an effort to perform enucleation without injury to the urethra. It is also stated that the prostate has two capsules, a thin, strong, fibrous one closely adherent to the gland, and another fibrous casing outside this which contains the venous plexus; the inner capsule is removed with the gland. Freyer believes that although the middle lobe may impede the flow of urine during the early stages of prostatic hypertrophy, yet the later obstruction is always caused

¹ Brit. Med. Jour., July 20, 1901.

² Brit. Med. Jour., Feb. 1, 1902.

by lateral pressure. [The originality which Freyer claims for the operation above described and his description of the anatomy of the prostate is assailed by a number of English and American surgeons. In the "British Medical Journal" for September 14, 1901, will be found a letter from Nichol and another from Bruce Clarke, and in the same journal for August 24th of the same year are letters from A. Mayo Robson, Eugene Fuller, and others, all of whom state that the operation done by Freyer is not new, and that his claim for originality is unfounded. Freyer defends himself against these attacks in a letter addressed to the "British Medical Journal" for September 14, 1901.]

Cuthbert S. Wallace¹ makes some remarks on the **treatment and the morbid anatomy of enlarged prostate**. So much interest has lately been excited as to how far total extirpation of the prostate is surgically possible that the author has made a number of examinations of enlarged prostates postmortem to determine this fact. Particular attention was paid to the so-called capsule of the prostate. The following quotation from the author's paper shows the difference between the normal prostate and the one the subject of hypertrophy: "(1) The organ is quite altered in appearance, and instead of being generally spongy to the eye, has lost its open structure and become converted into irregular lobulated areas which on section are smooth and firm. (2) The arrangement of the fibromuscular tissue has also undergone a great change, and instead of forming bands radiating from the posterior aspect of the urethra, now forms irregular septa running between the lobules. The anterior fibrous septum is less disturbed, and may exist intact or be more or less broken up. (3) The thin fibrous covering has given place to a thick definite 'capsule,' which further differs from the normal structure in that it is readily separable from the contained glandular substance." One of his illustrations shows a section through the middle of the prostate described in Case 1. "The central part, containing the urethra, has been shelled out from the 'capsule.' This can be repeated in every section of the organ, so that ultimately the organ is divided into two parts, namely, the 'capsule' and a contained glandular portion, in which lies the urethra, the only line of continuity between the two being the thick anterior fibrous septum which is continued in from the 'capsule' to join the periurethral tissue. If it were not for the intimate connection of the main glandular portion to the urethra, it would be possible to have a hollow sphere formed by the 'capsule' crossed axially by the urethra, suspended by the anterior septum, and between the two the loosely lying glandular part of the prostate. If during life the urethra had been sacrificed and the whole central part removed, the operator would have been justified in believing that he had removed the entire organ; certainly nothing recognizable as prostate would have been left behind." It is stated that there is certainly no capsule of the prostate comparable to that of the kidney. The outer fibrous "capsule" is derived from the pelvic fascia and cannot be considered an integral part of the organ. This internal "capsule" is the result of the rapid growth of adenomas

¹ Brit. Med. Jour., Mar. 29, 1902.

which press upon and change the true glandular tissue, causing it to resemble a capsule at certain points. The inner "capsule," then, is really altered prostatic tissue. Regarding enucleation, Wallace states that, judging from the examination of specimens and from attempts made in the postmortem room, it does not appear possible to enucleate the prostate in its normal state, leaving the presence of the urethra out of the question. When the organ is the seat of adenomatous hypertrophy, the adenomas are enucleable, and their enucleation may cause the surgeon to believe that he has removed the whole prostate. These adenomas can be removed with ease, without bleeding and without disturbing the ejaculatory ducts. These facts, taken together with the appearance of the tumors after removal, seem to leave no reasonable doubt that the so-called total prostatectomy is no more than the removal of adenomatous masses. There is no other method at the present time of differentiating between general enlargement of the prostate and adenomatous enlargement than that of exposure and palpation of the gland.

The **gravity and frequent unsuccessfulness of suprapubic prostatectomy** are pointed out by Albarran,¹ who states that the mortality of the operation ranges from 10 % to 15 %, and that even though immediate improvement follows the operation there is apt to be a return of the symptoms. He is a strong advocate of the perineal method of performing prostatectomy, and considers that this operation is only contraindicated in the presence of very advanced age, freedom from difficulty in catheterism, the existence of extensive periprostic or perivesical abscesses, serious lesions involving both kidneys, and advanced urinary cachexia. Albarran's method consists in removing the prostate piecemeal, the capsule being left. The perineal wound is kept open for a time. This operation, he declares, is free from great danger and gives remarkably satisfactory results. He has performed this operation 18 times without a death; of these patients, 8 are described as completely cured, being now able to micturate freely, and the urine being clear and limpid; one of the remaining cases could not be traced; 3 have an open sinus in the perineum; and the remainder have not been long enough under observation to judge of the ultimate outcome.

A **new combined electrocautery incisor for the Bottini operation** has been designed and described by Hugh H. Young.² The instrument is a modification of Freudenberg's, but it is claimed to be much more exact. The great advantage of the instrument is that it possesses several easily interchangeable blades of graded sizes which permits the surgeon to choose the blade best suited to the individual case. There are many reasons why this is necessary. Blade No. 3 of Young's instrument is the one which corresponds to that usually found in Freudenberg's instrument; blade No. 2 is useful in small hypertrophies and blade No. 4 for very large hypertrophies. Blade No. 1 was made rather with the idea of completing the set, but has since proved

¹ Bull. et Mém. de la Soc. de Chir. de Paris, No. 33, 1901.

² Jour. Am. Med. Assoc., Jan. 11, 1902.

of great value in certain cases. The employment of the instrument is illustrated in the report of 8 cases, in 4 of which blade No. 3 was used. In two cases in which blade No. 2 was used it is stated that the Freuden-berg instrument would probably have penetrated beyond the confines of the prostate. Blade No. 1 was used in the two remaining cases where the obstruction was caused by a very small median bar associated with complete atrophy of the lateral lobes in one case, and lobes of normal size in the other. Blade No. 4 has not been used, and it will not be found necessary except to attack a single very great hypertrophy of one lateral lobe. Although at first skeptical regarding the efficacy of the Bottini operation, Young, after an experience of 41 operations, is forced to testify decidedly in its favor. Among these cases there were 3 deaths, the patient in each case being in very bad condition before operation. Of the patients, 15 were over 70 years of age and 3 were over 80. Of these 18 patients, none died, and all but one have been cured of the prostatic obstruction. Of 13 patients who were obliged to use the catheter, only one required it after the operation. Young is of the opinion, after performing 15 prostatectomies, that in certain cases—that is, men between 45 and 60 in good condition and with easily enucleable enlargements—a complete prostatectomy is a very safe operation, and certain as to lasting results, although he is constrained to say the effects of the Bottini operation seem also to be permanent. He urges a careful study of the individual case before performing the Bottini operation and the careful selection of the blade to suit the enlargement. No two cases are alike and each should be a study unto itself. As a rule, the usual 3 incisions, 1 posterior and 2 lateral, are entirely sufficient for most cases, especially those of moderate hypertrophy.

Ramon Guiteras¹ presents a review of the various methods of performing **prostatotomy and prostatectomy**, and compares the results obtained from these two operations. Of 753 prostatotomies collected by Freudenberg, 622 were successful, 44 died, and 87 were failures. Of 152 well reported cases of prostatectomy performed by various methods, 25 patients died and 127 recovered; 17 of these latter are reported as failures, 27 as successful, and the remainder are spoken of as improved, recovered, or good results. According to these figures, the mortality in prostatectomy is three times as great as that in prostatotomy; failures are about as frequent in one operation as in the other, but the recoveries from prostatectomy are better and more permanent than those following prostatotomy. In very old men with slightly damaged kidneys and prostates that do not feel very large on rectal examination, but yet produce considerable urethral impediment, prostatotomy is called for; in middle-aged men with very large prostates, good kidneys and bladder, enucleation is preferable.

John B. Murphy² devotes considerable space to the discussion of **hypertrophy of the prostate gland** and the operations which have been designed for the relief of this condition, reaching the following

¹ Jour. Am. Med. Assoc., Nov. 2, 1901.

² Jour. Am. Med. Assoc., Mar. 29, 1902

conclusions: "(1) From the clinical reports and experience, it seems evident that in extreme cases prostatotomy is the operation of election. (2) It appears evident that in the hands of safe, far-seeing, informed practitioners, few cases will now be allowed to progress to this extreme condition before radical means are resorted to for permanent relief. The practice of to-day should be timely practice. (3) Continued use of the catheter is a menace to life, not to mention its discomfort, no matter how favorable the conditions for its performance. The patients all, sooner or later, suffer from cystitis and its sequels. (4) Prostatectomy gives the best permanent result, and is fraught with very little more danger than prostatotomy. (5) Suprapubic prostatectomy should be limited to exceptional cases of enormous intravesical enlargements of the prostate. It appears to us to endanger the sphincteric control more than the perineal operation. It is more sanguinary and the work is more difficult and distant from the operator. (6) The perineal is the most direct and least bloody route. It admits of a very large opening, and permits the prostate to be drawn quite into the open before it is attacked. It gives the greatest security against injury to the bladder-wall and least liability to disturbance of the internal sphincter. It endangers the rectum least and affords the best drainage. (7) It can be best performed through a Y-shaped incision, with a Sims speculum for a posterior retractor. The prostate is drawn out easily with sharp hook retractors, and best separated from the bladder from behind forward. The operation should never be performed in the dark; *i. e.*, through a small incision. (8) It should always be intracapsular enucleation *en masse*, allowing the anterior isthmus to remain. The hemostasis may be secured with forceps or a packing of subiodid of bismuth (not iodoform) gauze. The permanent catheter should not be introduced until the perineal tube is removed. (9) The patient should be kept in a semisitting position for 72 hours after the operation, and should be out of bed by the fifth day. He should drink large quantities of water from the onset. (10) Anesthetic is *sub judice*. Phosphate of sodium should be administered to keep the urine acid, and urotropin as an antiseptic. The personal equation must never be lost sight of in operating upon these cases, and attention to every small detail of the patient's general condition is necessary for the best results."

Geo. A. Syme¹ is an advocate of **enucleation of the prostate for prostatic hypertrophy**. The risks of the operation are not nearly so great as has been thought. The deaths which do take place result rather from existing complications than from the operation itself, and this fact speaks for early enucleation before complications have set in. The author does not, however, take the position of advocating enucleation in all cases. General enlargement of the gland with engorgement of the vessels causing "attacks of the prostate" often requires no operative treatment, and is the variety benefited by castration and vasectomy. The variety where general fibroid enlargement is present is the least amenable to surgical procedures; it is unaffected by castration or vas-

¹ Intercol. Med. Jour. of Australasia, Mar. 20, 1902.

ectomy and enucleation is difficult. The adenomatous form is the one in which enucleation is easy and the results good. Syme believes that the most frequent variety of prostatic enlargement causing distressing and continually persistent symptoms is the adenomatous form.

Orville Horwitz¹ considers the **present status of the Bottini operation as a method of treatment in obstructive hypertrophy of the prostate gland**, deriving his conclusions from a summary of 888 operations performed by 48 operators. Horwitz believes that hypertrophy of the prostate is a condition which commences much earlier than is commonly supposed. The subject is considered at great length and a table of the cases collected is presented. The conclusions reached are as follows: (1) There is less fear on the part of the patient to submit to the operation than there is to any other surgical procedure so far suggested for the relief of prostatic hypertrophy. (2) The principal advantages to be derived from the method of treatment are: A short time only is required to perform the operation, which is attended with little shock and usually slight loss of blood; convalescence is rapid, and the mortality is lower than that by any other radical measure. (3) Cures result in the large majority of cases, especially if the operation is undertaken early. Marked improvement may be looked for in a vast number of cases, in which otherwise individuals would be condemned to suffer, as the danger attending any of the other radical methods of treatment would be too great to warrant their employment. (4) Failures occur in but a comparatively small percentage of cases, want of success being due to the pathologic changes and complications which have taken place. Especially is this true where an incurable cystitis exists. (5) The operation is contraindicated when a valve-like formation exists, or when there is a greatly increased overgrowth of the three lobes, associated with tumor formation, giving rise to a pouch, above and below the neck of the bladder. (6) It may be employed with benefit and safety as a palliative measure in cases of prostatic hypertrophy of long standing, associated with cystitis, when the general health will be improved and constipation, which is usually associated with this condition, relieved, mitigating the prostatic spasm of the urethra, and rendering the insertion of the catheter easy and painless. (7) Pyelitis, when present, adds greatly to the danger of the operation, but is not always a contraindication to its employment. (8) The character of the growth has but little bearing on the result of the operation. (9) The operation may be employed as a safe and satisfactory means of causing a suprapubic fistula to close, which so frequently follows a suprapubic cystotomy when the prostate gland is hypertrophied. (10) In suitable cases it is not only the best radical measure thus far devised for the relief of prostatic hypertrophy, but is attended by the smallest mortality. (11) The operation is especially indicated in the beginning of obstructive symptoms due to hypertrophy of the prostate gland, and may be regarded as a prophylactic method of treatment. (12) The operation is capable of producing a symptomatic cure in a great number

¹ Phila. Med. Jour., Nov. 16, 23, 30, 1901.

of cases of various conditions and configurations of the prostate gland due to hypertrophy, as is shown by the disappearance of prostatic spasm, the restoration of the function of the bladder to its normal condition, and the improvement in general health. (13) When operating early, before the prostate has become much enlarged, the safest method to pursue is to perform a preliminary perineal cystotomy, introducing the 'perineal galvanocautery incisor' of Chetwood, so as to make the incision in the prostate. (14) In some instances a prolonged preparatory treatment is necessary before the operation can be safely undertaken. (15) In cases of prostatic obstruction, which have existed for a lengthened period, when there is chronic cystitis, the physical condition of the patient being below par, both local and constitutional treatment must be persisted in for months after the operation before the great benefit derived from the procedure can be insured, which treatment would be ineffectual unless the obstruction had first been removed."

L. Bolton Bangs¹ discusses some of the **conditions following the Bottini operation for prostatic obstruction**. In some individuals immediately after the removal of the Bottini incisor it will be found impossible to introduce either a soft-rubber or webbing catheter of any degree of stiffness. The obstruction is in the membranous and prostatic urethra, and consists in a firm and rigid contraction of both these portions of the deep urethra. Even when the patient is under the profoundest anesthesia it is sometimes impossible to pass these instruments. In order to overcome this difficulty, Bangs has had made a series of metal catheters patterned after the Trendelenburg searcher. This muscular contraction, which interferes with catheterization with soft instruments, usually subsides after 3 or 4 days. Regarding the process of repair after the Bottini operation, it is stated that it begins immediately after the operation. In a few cases Bangs has been able to introduce the cystoscope and observe the results; in one instance in which there was absolutely no blood the cystoscope was introduced immediately after the operation and the work done by the incisor was perfectly revealed. During the healing process it is well occasionally to pass a sound to prevent bridges of tissue forming across the incisions, and an occasional application of nitrate of silver to the granulating surfaces is also of advantage. The spontaneous urination which follows the operation is due not only to the formation of the grooves, but to contraction of the cicatrices and to atrophy of the gland-tissue. The post-operative treatment of these patients is of great importance. Bangs has had in his practice 42 cases in which the Bottini operation was done; over 60 % of the patients have been able to do away with the catheter; about 20 % have an increased amount of spontaneous urination; and 20 % received little or no benefit. Three deaths have occurred, 2 the result of sepsis and 1 the result of shock.

In his second Harveian lecture G. Buxton Browne² discusses the **treatment of prostatic hypertrophy**, stating that in all cases auto-catheterism should be employed unless attended by great difficulty.

¹ N. Y. Med. Jour., July 27, 1901.

² Lancet, Nov. 23, 1901.

Regarding acute retention due to prostatic hypertrophy, he states that there are no cases of prostatic disease in which it is impossible to pass a catheter into the bladder. Cases of enlargement in which autocatheterism is impracticable are extremely rare; such cases should be subjected to suprapubic cystotomy, when any calculi present may be removed and any obstructing outgrowth of the prostate enucleated. The author does not approve of the practice of castration or vasectomy.

Eugene Fuller¹ contends that **prostatectomy** is the **method of choice in the management of prostatic obstruction**. The author refers to the great frequency of prostatic hypertrophy in elderly men, and states that these often die directly or indirectly as the result of the prostatic disease. Neither the public nor a large portion of the profession have been educated beyond the idea of catheterism. As regards prostatic surgery, Fuller looks upon men under 65 years as young and upon men between 65 and 72 as middle-aged. Until recently the author was inclined to look upon men 75 years of age as beyond relief from prostatic surgery; this view, however, is no longer held, since good results are frequently obtained in men well past this age. Aside from the question of age, the surgeon should be guided by the physical and mental condition of the individual. Arteriofibrosclerosis can be mentioned as a decidedly unfavorable condition, since chronic interstitial nephritis always exists. Antecedent dissipation, and heart, lung, and liver disease, are all regarded as unfavorable conditions. The presence of putrid urine and an ascending pyelitis, instead of being looked upon as contraindications, should make operative relief more imperative. In the majority of cases demanding radical treatment prostatectomy is indicated. Only when malignant disease is present would a progressive genitourinary surgeon establish a permanent suprapubic fistula. In a minority of cases the operation of Bottini or castration may be considered. The cases demanding prostatectomy, and in which that operation alone will suffice, are grouped as follows: (1) Those not amenable to urethral instrumentation. (2) Those demanding vesical or perineal drainage as well as relief from prostatic obstruction. (3) Those in which renal infection exists as a complication. (4) All of those complicated by prostatic calculi in which litholapaxy is impracticable. And (5) those in which the prostatic obstruction is such as to require direct removal, not being amenable to less radical surgical treatment. The great advantage that prostatectomy has over the Bottini operation is that after the latter more or less residual urine is apt to be present, whereas after prostatectomy there is no residual urine. No surgeon should confine himself to the performance of the Bottini operation alone in cases of prostatic hypertrophy; if this is done, many cases will require a later prostatectomy, an operation which will be more difficult because of the existing cicatrices. Regarding the mortality of the operation in the hands of men familiar with its technic, Fuller states that it should not be greater than 5% to 8%. In patients under 65 years of age and who have no marked urinary infection the mortality rises in pro-

¹ Jour. Am. Med. Assoc., Nov. 2, 1901.

portion to the adverse conditions which may be present. Fuller states that familiarity with the operation has rendered it possible for him to discontinue the anesthetic at the end of from 10 to 15 minutes.

Greene and Brooks¹ discuss at some length the **nature of prostatic hypertrophy**, reviewing the literature of the subject and presenting a study of 58 cases in which a careful examination of the gland was made. In each of these cases there were evidences of inflammatory changes in the gland. The authors reach the following conclusions: "(1) Prostatic hypertrophy of the aged is the result of chronic prostatitis. (2) It most frequently arises from chronic posterior urethritis, of whatever cause. (3) True neoplasms of the prostate are rare and are not concerned in the production of prostatic hypertrophy. (4) Carcinoma is apt to occur in the hypertrophied prostate as a result of the chronic inflammatory process."

Stordeur² discusses the **treatment of chronic blennorrhagic prostatitis**, recommending the most careful hygienic regimen as regards food and habits, and the internal administration of such drugs as benzoic acid, salol, urotropin, etc. In addition to these, various local applications are recommended, together with rectal medication, hydrotherapy, electricity, and massage. Recently Stordeur has practised simultaneous lavage and massage with good results.

Carle³ has treated **chronic blennorrhagic prostatitis by massage and caustics** with uniformly good results. Before employing this treatment care should be taken to prove that the prostate is really involved. This can be learned by investigating the caliber of the urethra and the sensibility of its mucous membrane by the olivary tipped bougie, by rectal examination showing the sensibility, volume, and consistency of the prostate, and by an examination of the discharge, both microscopically and macroscopically. When a history of recent gonorrhea with persistent acute symptoms was present, Carle found it advisable to precede the massage with a sedative and decongestive plan of treatment consisting in rest, light diet, etc. In chronic cases the bladder is washed out with a weak solution of potassium permanganate, any stricture present is dilated, and the median lobe of the prostate is gently massaged with the sound; the fluid in the bladder is then evacuated and rectal massage of the prostate is done. When this is completed, the bladder is again washed out in order to get rid of the prostatic secretion. By means of Guyon's hollow olivary sound and syringe 10 or 12 drops of a silver solution is applied to the prostate. The strength of the solution should be gradually increased from 1 in 100 to 1 in 20. Carle has treated 11 patients in this way with the most satisfactory results.

An analysis of 128 cases of **vesical calculus** in which operation was performed is presented by Miculescu.⁴ The patients were all Macedonians, and, as a class, lived chiefly on vegetables. In this series of cases vesical calculus was found to be most frequent in the third decade of life, decreasing between the ages of 30 and 50, and increasing between 50 and

¹ Jour. Am. Med. Assoc., April 26, 1902.

² Progrès méd. Belge, Feb. 15, 1902.

³ Lyon Méd., Dec. 1-8, 1901.

⁴ Ther. Monatsh., vol. xvi, No. 1, 1902.

80. The stone was found to consist of urates in 24 % of the cases, phosphates in 41 %, oxalates in 31 %, cystin in 3 %, xanthin in 1 %. In one instance the calculus filled the entire bladder; in another case 300 calculi were removed. The author as a rule practises median lithotomy, combined, if necessary, with litholapaxy. The mortality in this series of 128 cases, 120 of which were operated upon by Miclescu himself, was 1.3 %. It is his practice to suture the perineal wound. To do this controls the hemorrhage and favors healing by first intention. He states that in 92 % of his cases the wound healed by first intention and in 6.7 % the wound healed by granulation in from 10 to 15 days.

Edward C. Rosenau¹ discusses the **association of stone and tumor of the urinary bladder**, reporting a case and presenting a collection of 44 cases. Arguments favoring the view that tumor increases the liability to the formation of calculus, and of the reverse view that vesical calculus is a factor in the etiology of tumors of the bladder, are presented, and the conclusion is reached that an etiologic relationship between calculus and tumor is not to be denied altogether, and that the percentage of cases in which calculus favors the development of tumor seems to be larger than that in which tumor favors the development of calculus.

M. F. Porter² reports a case of **stone in the bladder occurring in a girl 4 years of age**. The child at the age of 6 months presented symptoms of renal colic, which condition was confirmed a short time afterward by the passage of calculi. For the succeeding 2 years the patient passed a great number of small calculi. After this time the patient was free from attacks of renal colic until she became 4 years of age, when she presented symptoms of calculus in the urinary bladder. This diagnosis was confirmed by suprapubic cystotomy and the stone was removed. The weight of the stone when thoroughly dried was 60 grains, and it measured $\frac{7}{8}$ inch in width and $\frac{3}{8}$ inch in thickness. Immediate suture of the bladder with catgut was done, a small gauze wick being passed down to the line of suture. The bladder was drained for 5 days by a catheter kept in the urethra. The bladder healed primarily, the packing being removed on the second day. The case is of interest because of the early age at which the symptoms developed, because of the sex of the child and the satisfactory immediate closure of the bladder.

A collection of **45 cases of intraperitoneal rupture of the bladder in which the abdomen was opened and the bladder sutured**, and 6 cases in which the abdomen was opened but the bladder not sutured, is presented by Samuel Alexander.³ Out of the 45 cases, 23 deaths occurred, 16 dying from peritonitis; 2 from shock; 2 from hemorrhage; 1 from pneumonia; and 2 expired on the table. In 4 instances the peritonitis was due to imperfect suturing of the bladder. Three cases in which no suturing was done recovered. Without operation rupture of the bladder is sure to prove fatal. The rupture may be either intraperitoneal, extraperitoneal, or both. A blow upon the abdomen may

¹ Am. Jour. Med. Sci., April, 1902.

² Ann. of Surg., Dec., 1901.

³ Ann. of Surg., Aug., 1901.

result in bleeding from the mucous membrane of the bladder without rupture of the other coats. Concussion alone may cause a full bladder to rupture, but usually it results from a crushing force which presses the bladder against the promontory of the sacrum. Extraperitoneal rupture of the bladder is usually the result of a fracture of the pelvis. It is possible for normal urine to be extravasated into the peritoneal cavity without producing an infection, but if the urine contains micro-organisms the infection which follows is rapidly developed. The important symptoms of a rupture of the bladder are the sensation of something having given away, hypogastric pain, shock, rectal tenesmus, and great desire to micturate but inability to do so. The introduction of the catheter results in the withdrawal of a small amount of bloody urine, or of no urine; occasionally it is possible to carry the catheter well into the peritoneal cavity through the rent in the bladder-wall. Cases are on record where clear urine has been withdrawn from a bladder which is ruptured. One of the means of reaching a diagnosis is to inject boracic acid solution into the bladder and then withdraw it; if the same amount returns which was injected, there is probably no rupture. Alexander shows that this test is not altogether reliable, as in the case referred to 8 ounces of salt solution was introduced into the bladder and the entire amount withdrawn although there existed a rent in the bladder-wall 4 inches long. Air or hydrogen gas may be injected into the bladder and if the wall is unbroken the organ will assume its usual distended appearance, be tympanitic on percussion, and the gas will escape by the urethra when allowed to do so. If the tear is extraperitoneal, an emphysema of the surrounding tissues takes place; whereas if the gas or air escapes into the peritoneum, this cavity becomes generally distended. Alexander thinks that this inflation method is not only unreliable but absolutely harmful, as it may be the disseminator of infection and adds considerably to the shock. When the abdomen is already tympanitic, the method is also useless. Dulness on percussion in the flanks would suggest an intraperitoneal rupture of the bladder, while a unilateral swelling and tenderness would suggest that the extravasation of urine had taken place extraperitoneally. Since any rupture of the bladder requires surgical interference,—that is, a suprapubic incision,—Alexander thinks that it is unnecessary to differentiate between the intraperitoneal and extraperitoneal injury. If when the prevesical space is exposed no evidence of extraperitoneal rupture is found, then the incision should be increased and the abdominal cavity opened. If the rupture is found to be extraperitoneal, the treatment consists in thorough drainage; if urine has escaped into the abdominal cavity, this cavity must be thoroughly irrigated after accurate suturing of the bladder. An examination of the collected cases would tend to show that drainage of the bladder after operation does not materially affect the mortality. In 18 cases no drainage was employed—9 recovered and 9 died; in 21 cases a catheter was introduced into the bladder through the urethra and retained for several days—of these, 11 recovered and 10 died; in 2 instances the bladder was drained by the suprapubic

method and both patients recovered. Success depends upon operation performed at the earliest possible moment, thorough cleansing of the peritoneal cavity, and perfect closure of the bladder wound. Every hour saved between the time of the accident and the time of operation is of value. Often valuable time is lost in trying to make a positive diagnosis even when symptoms demanding exploration are present. Alexander puts little confidence in the injection tests, and thinks that they are frequently the cause of fatal delay. Several cases are referred to which illustrate this statement and form the basis of the author's attitude regarding this diagnostic measure. It is not thought necessary to distend the rectum in repairing the bladder wound, the Trendelenburg position affording sufficient space and light. Two very complete tables of the cases collected are submitted.

John A. Wyeth¹ reports an interesting and unusual case of **operative preperitoneal rupture of the bladder**. Rupture of the bladder resulting from an effort to distend the organ in order to reach it by the suprapubic route is of rare occurrence. The case reported is the only one of which Wyeth has knowledge in which the organ has ruptured into the preperitoneal space from surgical distention. The patient was a man 31 years of age whose bladder Wyeth wished to drain suprapubically because of frequent and painful urination. Fourteen ounces of fluid was injected into the bladder; this caused a slight elevation of the abdominal wall just above the symphysis pubis. Before the incision was made, however, this elevation had subsided, indicating that the bladder had ruptured. A rapid incision was made and the bladder opened; it contained about 4 ounces of fluid. The prevesical space contained a very large quantity of the injected solution. The rupture was about $\frac{1}{2}$ of an inch in extent, a little to the left of the median line in front but entirely within the prevesical space. In order to make sure that some of the fluid had not been forced to the posterior surface of the bladder, and that the peritoneum was not ruptured, Wyeth opened through the median line of the abdominal wall and explored carefully the peritoneal cavity; no fluid, however, was found here. Suprapubic drainage was established. Subsequently it became necessary to make an incision in the perineal region to relieve a well-marked infiltration, but the patient made a good recovery. Wyeth has performed suprapubic cystotomy between 60 and 70 times, and in every case has injected the bladder with sterile water, the minimum quantity varying from 12 to 14 ounces. In no other case has rupture occurred.

James Pedersen² reports a case of **intraperitoneal rupture of the bladder produced by a fall** of a distance of 12 feet from a window. The patient was operated upon 9 hours after the accident. A transverse rent in the bladder was found, measuring from $2\frac{1}{2}$ to 3 inches in length. This was closed and gauze drainage was inserted. The membranous urethra was opened and a perineal tube was inserted into the bladder. Some leakage from the upper wound occurred, and the patient ultimately made a good recovery.

¹ N. Y. Med. Jour., Oct. 19, 1901.

² Med. Rec., Mar. 22, 1902.

A case of **rupture of the bladder due to a kick in the abdomen** is reported by Routh.¹ The interesting points in this case are that the rupture occurred when the bladder was not distended, the patient having passed urine about an hour before the injury; that 38 hours elapsed after the injury before the abdomen was opened; and that there was a continuous oozing of blood from the urethra. In this case the abdomen was opened and thoroughly cleansed. Two rows of sutures were placed in the bladder wound. The bladder was kept empty by a catheter fixed in the urethra. The edges of the suprapubic wound sloughed, but in spite of this the patient recovered satisfactorily.

An interesting case in which **spontaneous rupture of the bladder** occurred is reported by Havas.² The patient was a man 55 years of age who was admitted to the hospital 4 days after the onset of complete retention of urine. At this time he was suffering from vomiting, hiccup, meteorism, and collapse. A catheter was passed without difficulty, but no urine was obtained. The patient died, and at the postmortem examination urine was found in the peritoneal cavity. A tear about 1 inch in length was discovered in the posterior vesical wall. On the anterior wall of the prostate there was a gutter-like tear which was directly continuous with a perforation of the membranous urethra, evidently the result of a false passage made in attempts at catheterism. A hypertrophied prostate is supposed to have been the cause of the retention.

Nancrede and Hutchings³ present a preliminary note on **sterilization of catheters**. Notes of 65 bacteriologic experiments are presented. The authors reach the following tentative conclusions: "(1) An infected soft-rubber catheter cannot be completely sterilized by boiling under 4½ minutes. (2) Mechanical cleansing from all dried pus, coagulated blood, or mucus will render sterilization easier and will demand a shorter time to be effective. (3) Elastic (English web) catheters and soft-rubber catheters can be repeatedly boiled for 5 or more minutes without roughening of their surfaces or diminution of their elasticity and strength. (4) Chemical sterilization by immersion in a 1 : 2000 mercuric chlorid solution for 5 minutes does not sterilize any variety of catheter which has become infected, at best only inhibiting the growth of the germs, for if the mercuric salt be precipitated by ammonium sulfid the germs will grow freely when implanted in culture-media. (5) The results of experiments, as stated in the previous conclusion, indicate that chemical sterilization should never be employed for catheters which are to be retained in the bladder for any length of time, unless subjected to a very prolonged action of the mercurial salt, lest the merely inhibited germs develop. (6) Should mercuric chlorid be employed for the sterilization of catheters, it must be in a concentrated solution and the catheter must remain in it for a much longer time than the usual period considered amply sufficient in the laboratory, no mere washing with any chemical solution being efficient for an infected instrument. (7) Formalin vapor will sterilize infected instruments in 24 hours; how much

¹ Brit. Med. Jour., Sept. 21, 1901. ² Pest. med.-chir. Presse, Oct. 27, 1901.

³ Med. News, Nov. 23, 1901.

shorter time will be sufficient we have not as yet determined, but propose to do so in the future. (8) All methods of sterilization commonly employed should be continued for much longer periods than the minimum time required for destruction of germs in the laboratory. (9) English web catheters can apparently be more readily sterilized by heat than can soft-rubber catheters, probably on account of their interior construction."

Parascandolo and Marchese¹ present the results of experiments upon animals in the **treatment of cystitis by curetment**. The bladders of 10 dogs were infected in various ways and with various microorganisms. Later the bladders were scraped with a sharp spoon after suprapubic cystotomy. The results obtained were said to be quite satisfactory. The authors state that curetment of the bladder in man has been practised by a number of surgeons with great success; in the female it can be done by the urethra, in the male a suprapubic cystotomy is required. It is quite difficult to scrape the lateral and superior vesical walls owing to their mobility, but these parts are usually least affected in chronic cystitis. Any bleeding accompanying the operation can be controlled by injecting a 4% solution of antipyrin or a concentrated ferripyrin solution.

Fenwick² presents some clinical observations on the **treatment of severe stammering bladder and urethra**. The term "true stammering bladder and urethra" should be confined to those cases in which urination cannot be performed at will although the organs are anatomically normal. "False stammering" may be applied to cases in which there is some mechanical or pathologic interference with micturition. Fenwick does not agree with those who have stated that no organic ill effects follow the condition of stammering bladder, feeling assured that in severe cases cystopyelitis may ensue. He states that the cause of this condition is usually spasm of the compressor urethrae. For the relief of the spasm he recommends a longitudinal section of the muscle. Lately he has been able to tenotomize the muscle without opening the urethra.

Keyes³ reports 10 cases in which **pulmonary embolism followed operations upon the bladder or prostate**. He speaks of the symptoms of pulmonary embolism, but shows that in many of the cases a diagnosis has not been definitely made until after death. The condition in almost all cases has occurred when the patient was apparently doing well, and often when his cure was considered complete. The notes of the 10 cases reported are meager and some of them only suggestive, but Keyes feels that when one considers the venous plexus surrounding the prostate gland and the slow circulation of this organ it is surprising that pulmonary embolism following operations upon it are not more frequent. The age of the patient and the condition of the urinary tract are also conditions which predispose to this postoperative complication.

Fred. Bierhoff⁴ discusses **cystoscopy, its value and dangers**. It is the author's custom to employ the Nitze cystoscope and its modifications, since this instrument has given him the greatest satisfaction with

¹ Wien. med. Woch., Oct. 5, 12, 19, 26, 1901. ² Brit. Med. Jour., Feb. 1, 1902.

³ N. Y. Med. Jour., April 5, 1902.

⁴ Phila. Med. Jour., May 31, 1902.

the least degree of risk and discomfort to the patients. Whatever the source of the electricity, a proper rheostat should be connected with the source of the current to regulate the supply which reaches the cystoscope. Usually a 32 candle-power lamp suffices. In males it is his custom to employ a few grams of 1 % cocain solution before passing the instrument. Careful irrigation of the urethra and bladder should be performed; irrigation should be continued until the fluid returns *clear*; great stress is laid upon this point, since many a bad result is due to imperfect transparency of the filling fluid. A sudden turbidity of a fluid which has become almost clear on irrigation is indicative of the entrance of more pus into the bladder from the ureter. In no case should an attempt be made by any but an expert to examine a bladder which contains less than 100 cc. of fluid in the male and 150 cc. in the female. Before turning on the current in the case of female patients, Bierhoff has found it a valuable precaution to test the limits of safe excursion in the bladder by using the cystoscope as a sort of sound to determine the position of the uterus. If this is not done, the encroachment upon the bladder-cavity by the uterus may result in cauterization at this point. The bladder should be examined systematically, beginning with the lower margin of the sphincter, then the trigone, the ureters, etc. The author shows that cystoscopy is not always easy of performance. The dangers of cystoscopy, it is said, have been much exaggerated, and the author believes that when disasters have occurred they have taken place through faulty technic or carelessness on the part of the examiner. If proper aseptic precautions are observed, cystoscopy should not be more dangerous than catheterization. Severe reaction and infection following cystoscopic examination, even in infected bladders, are in almost every case due to cauterization of the vesical wall with the cystoscopic lamp. Ureteral catheterization with the ureter-cystoscope, Bierhoff believes, when properly performed, is preferable to and more certain than the various forms of segregators. It is stated that the near future will see lavage of the pelvis of the kidney recognized as the treatment indicated in cases of non-calculous pyelitis. Ureteral catheterization, when properly performed, is not accompanied by danger; the operator should, however, be most careful to avoid any laceration or wounding of the ureter.

Frederick Bierhoff¹ describes a **new cystoscope for the simultaneous catheterization of both ureters** and for double-current irrigation of the bladder. The instrument is a modification of the Nitze-Albarran catheterizing cystoscope and consists of a cystoscope upon which is a movable catheterizing portion.

Fenwick,² in referring to an article by Kraske in which he describes an instrument for making suprapubic puncture and cystoscopic examination, states that this method is not new, but was advised and practised by him 10 years ago. The Kraske instrument consists of a straight cystoscope which is pointed at the end like a trocar so that it makes

¹ Med. News, Mar. 8, 1902.

² Brit. Med. Jour., Mar. 29, 1902.

its own puncture. Fenwick makes the puncture with an ordinary trocar, and through this introduces the cystoscope.

Kraske¹ states that he has had recent opportunity to employ **suprapubic cystoscopy** in patients in whom urethral cystoscopy was impracticable. The author was so pleased with the satisfactory results that he has devised a straight cystoscope which is pointed at the end like a trocar so that it makes its own puncture. Kraske states that in such operations as the Bottini operation this method will prove of the greatest advantage, since it gives the surgeon a fair view of the work which he is doing in the bladder. In other intravesical manipulations it is evident that they can be more freely and readily done when they are controlled by a cystoscope which is unattached to the surgical instrument.

Donald Kennedy² reports a case in which he employed **suprapubic cystoscopy** with fair satisfaction. The author believes that this method may be improved upon and yet become a recognized method of examining and treating certain bladder conditions.

Geo. A. Peters³ reports 3 additional cases in which he has **transplanted the ureters into the rectum for exstrophy of the bladder** by his **extraperitoneal method**. [A report of Peters's first case will be found in the YEAR-BOOK for 1902.] Referring to his first operation, Peters states that it is now 2½ years since it was done, and that the boy is in perfect health and growing normally. In his 3

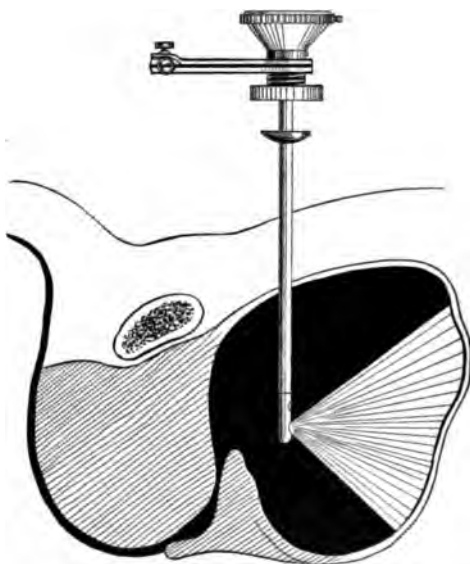


Fig. 43.—Fenwick's trocar cystoscope (Brit. Med. Jour., Mar. 29, 1902).

subsequent cases Peters has performed practically the same operation as was done on this first patient. The operation consists in the introduction of a soft-rubber catheter, No. 5 to No. 7, in each ureter for a distance of 2½ to 3 inches; the catheter is fixed in position by passing a very fine silk suture through the wall of the catheter and then through the wall of the papilla. The ureter, with a fair-sized roset of adjacent mucous membrane and muscle-wall of the bladder, is then separated from the surrounding tissues without opening the peritoneal cavity. When the cellular tissue through which the ureter passes is reached, its separation is comparatively easy. The ureters should be freed until they can be carried in a practically straight line from the brim of the pelvis to the

¹ Centralbl. f. Chir., No. 6, 1902.

² Med. Rec., April 19, 1902.

³ Canad. Jour. M. and S., April, 1902.

wall of the rectum; the lateral wall of the rectum is then exposed by blunt dissection without interfering with the peritoneal cavity. This dissection is greatly facilitated by holding one finger in the rectum. Care should be taken to keep well to the lateral aspect of the pelvis during this dissection in order to avoid injury of the peritoneum, since Peters states that the essence of his operation lies in the fact that it is completely extraperitoneal. Having thoroughly exposed the rectum, a pair of forceps is passed into it and the point pressed against the selected spot. The rectum is opened at this point on the forceps, which are passed through and made to seize the end of first one and then the other catheter, which are then drawn into the rectum and out at the anus. Care should be taken not to injure the ureter during this part of the operation. The catheters are directed into the mouths of separate bottles containing a solution of carbolic or boracic acid; in this way it can be ascertained whether both kidneys are working and the quality of urine secreted by each. The ureters are drawn just through the rectal wound and Peters does not recommend that they be sutured in this position, since there is nothing to cause them to move out of place and their vitality would be impaired by the traumatism of suturing. To prevent the injurious effects of any extravasation which might occur from the rectum to the wound in the pelvic cellular tissue the wounds are packed on each side fairly firmly with iodoform gauze, which is left in position for 2 or 3 days. Peters's second case was a child 13 years of age. At the end of a week he could hold the urine without difficulty for an hour or two. A little less than a month after the operation he could hold the urine for 4 or 5 hours without difficulty. The retentive power was better during the day than at night. Five months after the operation he is reported as being able to hold the urine from 2 to 6 hours during the day, and it is said that he is seldom disturbed at night. The third case was a female child one year of age. Four months after operation the patient was able to hold the urine from 1 to 4 hours during the day and sometimes for half the night. The fourth case was a boy $4\frac{1}{2}$ years old who died on the fifth day after operation from an ascending infection which reached the kidneys. Peters has made several slight modifications of his original operation. Dilation of the sphincter is still considered advisable, but he does not find it necessary to insert the sponge into the rectum. The rectum should, however, be washed out as well as possible by an enema given some hours previous to operation. Peters does not concur in the conclusions reached by Peterson (see YEAR-BOOK, p. 299, 1902), who, after an extensive study of this question, decided that the transplantation of the ureters into the rectum was unjustifiable in cases of exstrophy, and who favors the transplantation of a vesical flap including both the urethral orifices into the descending colon. Peters believes that there is at the natural termination of the ureter a valve action which protects the ureter and kidney from infection. He states that the papilla once transplanted into the rectum without interference with its circulation does not slough off, but after attaching itself to the rectal mucous mem-

brane becomes continuous with this structure. In his own case, in which infection occurred, Peters believes that it took place because the valve action of the ureteral opening was interfered with by the presence of the catheter, and in the future he contemplates trusting solely to a tube in the rectum to carry off the urine.

David Wallace¹ attributes the apparently greater frequency of **bladder tumors** to more accurate diagnosis. The cystoscope has done a great deal to aid diagnosis of tumors of the bladder. Prior to the year 1888 tumors of the bladder were considered a rarity, but at the present time the condition is a common one. In discussing this question Wallace's remarks are confined to primary growths of the bladder-wall, and Albarran's classification of these tumors is approved. He calls attention to the fact that small benign growths may prove fatal, producing, as they do, hemorrhage, cystitis, and secondary renal involvement. The most important symptom of bladder tumor is bleeding, unaccompanied by pain or any other symptom, although occasionally pain and frequent micturition may be present in the early stages of the case. The hemorrhage is intermittent, the urine between times being clear; at a later period cystitis develops. Months occasionally, and sometimes even a year, may intervene between the hemorrhages. Tumor cells are seldom found in the urine. The prognosis depends upon the character of the tumor, its extent, site and attachment, and the presence or absence of sepsis. The cystoscope is of great value as a diagnostic means. It must be remembered that a tumor with a narrow pedicle may have a deep attachment; this accounts for the occasional recurrence after removal. In operating upon tumors of the bladder the suprapubic route is the one of choice; the vertical incision is as satisfactory as the transverse and is less apt to weaken the abdominal walls. The author does not recommend Peterson's bag, but finds the Trendelenburg position of great advantage. The bleeding after removal can be remedied by the injection of hot water. When it is possible, it is recommended that a portion of the whole thickness of the bladder-wall be removed. Free access must be had in operations for these tumors, and the urethral and perineal methods are not approved. Drainage, by means of Cathcart's adaptation of the Sprengel pump, is to be employed after operation. Patients are allowed to sit up a day or so after the operation. The author devotes the latter part of his paper to the treatment of enlargement of the prostate. He lays great stress upon the necessity for asepsis in the employment of the catheter. The varying results following castration and vasectomy are due to the varying pathologic conditions of the gland; when the gland is largely composed of erectile tissue, the results are most satisfactory. The author has never seen a permanent fistula follow a suprapubic prostatectomy when the entire urethral obstruction had been removed.

An interesting case showing the **tolerance of the urinary tract for operation** is reported by Ferguson.² The patient was a boy of 8 years who 2 or 3 weeks following a fall developed a painless swelling in

¹ Lancet, July 13, 1901.

² Jour. Am. Med. Assoc., July 5, 1902.

the right loin. As the contents of the swelling seemed to be fluid a trocar was introduced and the supposed cyst-contents removed. A urinary fistula, however, followed this procedure and persisted. The boy came under Ferguson's care for the treatment of the urinary fistula. An x-ray picture showed a calculus in the right kidney and a small one in the left. When the right kidney was exposed, it was shown that the trocar at the original operation had entered the pelvis of the kidney, and that there existed about this structure an abscess with considerable destruction of anatomic relations. Under the circumstances it was thought best to do a nephrectomy, as repair of the pelvis was impossible. This was done and the patient made a satisfactory recovery, which was interrupted, however, a few weeks later by symptoms of ureteral obstruction on the left side. This kidney was then exposed and a stone found in the ureter about 2 inches below the pelvis. It could be easily pushed back into the pelvis, however, and thence it was removed, a urinary fistula following for a time. Before convalescence from this operation was complete the patient developed symptoms of obstruction of the urethra, and under anesthesia a stone was removed after splitting the meatus. About a month subsequent to this third operation there was evidence of calculus in the urinary bladder. A suprapubic cystotomy was done and the stone removed. The operative recovery from each of these operations was most satisfactory, the patient passing a good quantity of urine and developing no postoperative complications. The patient was perfectly well 2½ months after operation.

Permanent catheterization is discussed by Eastman,¹ who has employed it in 15 instances. In 2 of the cases permanent catheterization was maintained for more than 2 months, and in all of the cases for more than 10 days. The urethra seemed to develop a tolerance for the catheter, and the slight inflammation which was set up by its presence subsided within a few days. Large catheters were employed because they caused less irritation by friction than the smaller instruments and maintained their position much better. In no case did cystitis develop as a result of the treatment, and in 2 cases in which cystitis was the condition for which the permanent catheterization was employed the pain and stranguery were distinctly relieved. Permanent catheterization presents the following advantages: The urine is withdrawn through the natural passage; if there is a perineal wound it closes much more readily because the irritating urine does not flow through it; by this method the caliber of the urethra is maintained; the difficulty of postoperative catheterization is avoided; the urine may be drained into a receptacle, thus avoiding soiling the bed and irritating the patient's skin; the danger of urinary absorption and of bacterial infection is reduced; narrowings of the urethral tract are removed by pressure absorption; and the final advantage is that in certain cases of cystitis the patient is not subjected to a surgical operation.

¹ Jour. Am. Med. Assoc., Nov. 9, 1901.

PLASTIC SURGERY, BURNS, ULCERS, AND GUNSHOT WOUNDS.

Geo. V. I. Brown¹ discusses the **surgical correction of cleft palate** and presents a number of illustrations showing plaster casts of cleft palates before and after operation, and also photographs of patients. The author, in discussing acquired clefts of the hard palate, expresses the opinion that it is better to cover such openings by a neatly fitted denture, although if the soft palate is involved an operation is indicated. Unless the vitality of an infant is threatened by the malformation interfering with the taking and digesting of food, it is thought unwise to operate at this time of life, since the mortality from such operations in infants is very high. It is the author's custom, before operating for the closure of a cleft of the hard palate, to introduce a metal rod extending from one side of the maxilla to the other and arranged with a screw in such a way as to draw the two sides of the jaw gradually together. He has found this preparatory procedure of the utmost value in closing wide clefts; in early life especially the two sides of the maxilla can gradually but readily be brought into very close approximation. When the two edges of the cleft are in contact, they can be bored with a drill, and union of the hard palate will frequently take place without further operative interference. The edges of the cleft in the soft palate can be approximated with every expectation of prompt healing after union of the hard palate is complete. Even in adults this procedure is found to be of the utmost value. In order to approximate the two halves, in these patients it may be necessary to break the outer plate of the maxillary bone. Illustrations showing the rod in position, as well as the results obtained by this method of procedure, accompany the article. The author concludes as follows: "(1) The risk of operation in early infancy is unnecessary except where vitality of the child is threatened by malformation. (2) The most favorable time for operation is after the deciduous teeth have been erupted, but before the habit of speech has been acquired. (3) Difficulty of acquiring correct methods of pronouncing words after operation in adult cases can only be overcome by careful mental training. (4) There can be no cases which cannot be improved by treatment and operation, both with regard to health and speech, no matter what the age may be, providing the cooperation and assistance of the patient may be assured."

W. Arbuthnot Lane² presents an extensive study of **cleft palate**, and refers to the character of the various bones of the face and to their development. He shows that unless the cavities and organs of the face perform their proper functions during early life the bones about them do not become properly developed; this principle is applicable not only to the face, but to all parts of the body. During its development the lower jaw is molded upon the upper, and anything that interferes with the free movement of this bone impairs, to a corresponding extent, the development of it. The author refers to the want of development in

¹ Jour. Am. Med. Assoc., Jan. 25, 1902.

² Lancet, Feb. 15 and 22, 1902.

the bones of the nose and face noticeable in childhood and produced by mouth-breathing. In order that a proper development should take place the nasal cavity and cavities adjacent to it require the free passage of air during both inspiration and expiration, and the author suggests that if the nasal and adjacent cavities were made to perform their functions during early life there would be much less need for the nose and throat specialist. Lane also shows that protrusion of the upper jaw results from a want of development of the nasopharynx. It is remarkable how frequently an acquired deformity is transmitted from parent to child. The great frequency of inflammatory conditions of the nasopharynx, such as adenoids, etc., is, in most part, due to mouth-breathing; a number of illustrations are presented to show the "attitude of rest" habitually assumed by mouth-breathers. The respiration of such patients is shallow and almost entirely diaphragmatic, the thoracic respiratory muscles are poorly developed, the shoulders droop, and the angles of the scapulæ stand out prominently; the chest expansion is very small; the changes noted in the face are a partly open mouth, showing the upper teeth and sometimes the gum, the nose compressed laterally, its tip frequently tilted up, and the face below the orbits hollowed. As has before been said, such non-use of the nasal cavities results in hypertrophies of the mucous membrane of the nasopharynx. A great mistake is made in supposing that the removal of such hypertrophies will alone result in a cure; for the operation must be followed by measures which improve the method of respiration and properly ventilate the nasopharynx. Lane presents figures to show the wonderful improvement that takes place in children suffering from chronic inflammatory conditions of the nasopharynx when proper attention is paid to the method of respiration. Such children need to be taught to breathe with the mouth closed and to inspire deeply, thoroughly airing the nasopharynx and expanding the chest. When this treatment is well carried out, it will be found that the chest expansion will become greatly increased and that the child will gain greatly in flesh. The nasopharyngeal condition will also gradually disappear. Lane makes a strong plea for early operation in cases of cleft palate, because, after the repair of the opening between the nose and the mouth, the nasal cavities can be made to perform their function, becoming correspondingly developed, and that distressing condition, the nasal voice, is overcome. He advocates operation between the fourth and fifth weeks unless some contraindication be present. He prefers to operate by raising a flap of mucous membrane from one side and securely fastening it beneath the separated margin of the other side. When operation is performed thus early in life, it is accompanied by much less hemorrhage than when done later. Lane prefers, when harelip and cleft palate are associated, to operate first upon the cleft palate, as it is less accessible if the lip is first repaired.

John H. Branth¹ presents a lengthy discussion on **cleft palate and its association with harelip**, which is accompanied by numerous illustrations of double harelip and cleft palate. In these cases operative

¹ N. Y. Med. Jour., Aug. 10, 1901.

measures offer the only relief. Where the intermaxilla is projected forward, Branth prefers to wait until the central incisors are cut before operating, as they afford a secure anchorage for the stitches which are to unite the intermaxilla with the lateral portions of the maxilla. Efforts at closure which fail, the author thinks, instead of rendering the parts less susceptible to repair, tend to make them more so. All such cases require courage and perseverance on the part of both patient and surgeon.

Geo. W. Raymond¹ refers to the unsatisfactory results frequently obtained from the **operative treatment of congenital cleft palate**, stating that he has never seen a patient in whom perfect speech has been obtained by operation. The author is a strong advocate of the use of obturators, and reports a number of cases in which he has been able with an obturator to obtain excellent results.

Moszkowicz² describes the **use of paraffin in the clinic of Gersuny**, reporting 30 cases in which purified paraffin was injected hypodermatically. Solid and liquid paraffin when mixed in certain proportions make an ointment with a melting-point of from 94.8° to 104° F. This ointment is sterilized by boiling, and while liquid can be drawn into a syringe, and then, after cooling somewhat, can be expressed from the needle as a semisolid mass. In the use of this preparation one should be careful that the melting-point is not too high, since thrombosis of the veins in the neighborhood is likely to result from the use of too hot a preparation. Sterilized paraffin produces no toxic effect and no reaction when injected hypodermatically. After injection the paraffin remains in the position in which it is placed, and finally becomes encapsulated, remaining of cartilaginous hardness unless, soon after its introduction, it is exposed to pressure. Paraffin has been employed subcutaneously to replace a testis, to remedy incontinence of urine in women, to improve phonation after operation for cleft palate, to cure incontinence of feces, to narrow the inguinal rings in hernia, and to remedy prolapse of the vagina. It should be remembered that when used about the genital tract it may interfere with subsequent labor. The sinking-in of the cheek which follows the removal of the upper jaw may be prevented by injecting paraffin. The author also refers to a number of other indications for the use of this remedy.

Two interesting cases of **saddle-nose in which paraffin injections were employed with satisfactory results** are reported by Rupert M. Parker,³ who presents photographs of the patients. The author reviews the history of this method of repairing deformities, first introduced by Gersuny. The paraffin should have a melting-point slightly above the normal temperature of the body. In Parker's own cases he combined ordinary soft paraffin in lumps and oleum petrolati, the melting-point of the mixture being found to be 102° F. This mixture can be sterilized by heating it to the boiling-point for a few minutes, and this sterilization is thorough, since its boiling-point is much higher than that of water. A hypodermic syringe constructed entirely of steel is better than the

¹ Boston M. and S. Jour., Feb. 6, 1902. ² Wien. klin. Woch., June 20, 1901.

³ Jour. Am. Med. Assoc., April 19, 1902.

ordinary glass hypodermic with leather piston. The needle is introduced at some distance from the point at which the distribution of the paraffin is required, and the mixture should be of such consistency as to flow from the needle as a worm-like, semisolid, coherent thread. When this tissue is inelastic and dense, the injection of paraffin should be preceded by one of Schleich's solution, which not only anesthetizes the parts, but at the same time dilates the lymphatic spaces in anticipation of the paraffin. The author considers the method to be perfectly safe, notwithstanding the theoretic objections which have been raised by certain writers. A patient of Gersuny's presents no diminution in the size of the prosthesis after 2 years. The only possible danger would seem to be that of lung embolism, but even this is hard to imagine unless the paraffin is injected directly into a vein.

Harmon Smith¹ reports 3 cases in which he has employed **subcutaneous injection of paraffin in the correction of nasal deformities**, and presents pictures of the patients showing the improvement. He employed paraffin with a melting-point of about 115° F. After filling the syringe with the paraffin it is submerged in sterile water at 120° F., in order to keep the paraffin at the desired temperature until ready to make the injection. The injection should be made slowly and the thumb and index-finger of the left hand should mold the paraffin to the necessary shape. The paraffin is likely to force its way into the inner canthi of the eyes unless these are protected by pressure of the fingers. The paraffin remains in a plastic state for about a half minute, during which time it can be molded as desired. In two cases some redness and swelling resulted, but this rapidly subsided under application of ice.

Two cases of **saddle-nose** the result of syphilitic ulceration which were treated by the **subcutaneous injection of paraffin** are reported by Downey.² (Plate 4.) Sterile paraffin with a melting-point of 104° F. was employed. The paraffin is injected through a needle which is kept hot by an electric current, and the nose is rendered warm by means of hot dry sponges. Pressure is employed about the area which is to be injected in order to prevent the spread of the paraffin into the adjacent tissues. Molding is practised as the paraffin cools. The skin becomes white and glazed as the injection is first made, but later becomes bright red in color. No reactionary symptoms occur and no pain is experienced after the injection is made. In one case 2 drams were injected and in the other 1 dram.

Chas. G. Foote³ describes a method of **painless skin grafting** which consists in infiltrating the skin that is to be transplanted with decinormal salt solution. The skin is infiltrated until it is raised in a wheal, as in the ordinary Schleich infiltration method. The grafts can then be cut without pain.

Gaston Torrance⁴ reports a number of cases in which he has removed **skin grafts** painlessly by first freezing the skin with ethyl chlorid. In all of the cases the grafts did well.

¹ N. Y. Med. Jour., May 17, 1902.

² Med. Rec., Nov. 9, 1901.

³ Brit. Med. Jour., May 3, 1902.

⁴ Phila. Med. Jour., July 13, 1901.

PLATE 4.



Downey's cases of saddle-nose, the result of syphilitic ulceration. Treated by the subcutaneous injection of paraffin (Brit. Med. Jour., May 3, 1902).

Frank E. Peckham¹ reports a unique case of **Dupuytren's contraction** in which the new-growth occurred in the flexor tendon itself. This case shows the necessity of performing the open method of operation in cases of Dupuytren's contraction.

Alexander Ogston² presents a communication upon **burns resulting from the spontaneous ignition of celluloid combs**, such as are worn in the hair. He refers to the great frequency of this disaster, and it is thought that celluloid should, in some way, be rendered incombustible, or that manufacturers should be compelled to mark these articles "ignitable." The author had a number of experiments carried out in order to discover the ignition point of celluloid articles such as are commonly sold in the shops, and found that this point varied greatly, the cheaper articles igniting at a lower point than the more expensive ones.

Sir William Thomson³ presents **some surgical lessons from the campaign in South Africa**. He speaks of the general effect of modern small-bore fire, and shows that as a result of the recent change in the caliber and consistence of bullets modern warfare is much more humane than that of a generation ago. One interesting fact to which attention is called is that the modern bullets striking the soft parts sideways, after a ricochet, will often produce such extensive laceration of the tissues, particularly at the wound of exit, that the surgeon may be inclined to believe the wound to be the result of an explosive bullet. The rapidity of repair, even in long flesh wounds of the extremities, is most remarkable. The author does not put much credence in the theory that the bullet is aseptic by the heat generated in its flight, but thinks that the factors tending to the primary healing of these wounds are the early application of the first dressing, the immobilization of the part by bandages, and the small track left by the bullet, which, by promptly collapsing, excludes the air. The dry climate of South Africa is also thought to have contributed largely to the rapid healing of the wounds. The modern bullet was found to produce extensive bone injury when it entered the latter at close range, but it seldom lodges in the bone, as is the case with the older form of bullet.

The author calls attention to the wonderful improvement made in the treatment of gunshot wounds of the thigh, since amputation is now the exception, whereas it was formerly the rule. He protests against the examination of gunshot wounds in the field hospitals, except under unusual circumstances. He also advises that, except under peculiar circumstances demanding the opening of the abdomen, the conservative plan of treatment be pursued. He is also opposed to the search for lodged bullets unless such give rise to trouble. The author refers to the practical absence of such infectious diseases as tetanus, erysipelas, pyemia, and hospital gangrene, and agrees with von Nussbaum that "the fate of the wounded rests in the hands of the one who applies the first dressing."

W. Watson Cheyne⁴ discusses the **treatment of wounds in war**, basing his remarks upon his recent experience in South Africa. The

¹ N. Y. Med. Jour., July 20, 1901.

² Amer. Med., Aug. 10, 1901.

³ Lancet, Feb. 22, 1902.

⁴ Birmingham Med. Rev., Nov., 1901.

author states that even in the case of small wounds the experience gained in South Africa ought not to lead surgeons materially to modify their practice in civil surgery. The rules of civil practice are the best to follow in war so far as the circumstances of the case will permit. The thing to aim at in military surgery is to carry out as far as possible the rules which experience in civil surgery has found to be the best. When Cheyne went to the front, he concurred in the view that perforating wounds of the abdomen and perforating wounds of the intestines due to the Mauser bullets frequently resulted in recovery, and that the rule of noninterference was probably the best one to follow. His experience, however, has caused him to change his mind in this respect. He found that when there was distinct evidence of injury of the intestine the great majority of the patients died of septic peritonitis, just as they do in civil practice. The cases of perforating wound of the abdomen which recovered without operation he looks upon as cases in which there was no perforation of the viscera. It is granted, however, that a bullet traveling at a high velocity and making simply a small puncture of the intestine may not result in death. In civil life surgeons feel that if no perforation of a viscus is found no harm has been done by the operation. This statement, however, does not apply to military surgery, since the conditions surrounding the operation are not such as to render justifiable so sanguine a view. The good results obtained in South Africa are attributed by Cheyne more to the velocity and shape of the modern bullet and to the dry atmosphere of South Africa than to the employment of asepsis. It is greatly to be regretted that patients are forced to be moved from the field hospitals to the base hospitals. The author recommends the establishment of field hospitals properly appointed to do immediate and aseptic work. The objections to this are the fact that the army medical corps and supplies would soon be exhausted and that the convalescing patients would probably fall into the hands of the enemy. The suggestion made could only be followed after an agreement of the civilized nations.

Raymond Spear,¹ U. S. N., reports 13 cases of **gunshot wounds** occurring on the Isthmus of Panama. These injuries were all produced by the old 45-caliber lead bullets, and the cases reported make quite a contrast to those reported from South Africa.

Louis A. LaGarde, U. S. A.,² reports the **results of gunshot wounds of the knee-joint produced by the projectile of reduced caliber**, and compares these results with those obtained in the treatment of wounds from large caliber bullets in both the preantiseptic and antiseptic periods. The comparison shows that the employment of the modern bullet results in much less loss of function of limb and of joint.

George Gellhorn³ discusses **gunshot wounds of the pregnant uterus**. He has collected 18 unclassified cases of this condition which show that the contents of the uterus greatly diminish the force of the bullet, so that complete perforation of the organ is not usual. After

¹ N. Y. Med. Jour., April 19, 1902. ² Boston M. and S. Jour., May 22, 1902.

³ St. Louis Med. Rev., Nov. 2, 9, 1901.

such an injury symptoms of hemorrhage and shock usually set in, but in the author's series there are two notable exceptions to this rule. In each of these cases the uterus expelled its contents, the child dying shortly afterward, but the mother recovered, and in neither of the cases did any serious symptoms present themselves prior to the emptying of the uterus. Hemorrhage from the wound in the abdominal wall was very slight in some cases and profuse in others, while in still others it was mixed with amniotic fluid. Intestinal perforation complicated the uterine wound in many of the cases. General peritonitis usually manifested itself in those cases which recovered from the immediate shock. In most instances labor pains set in a few hours after the infliction of the injury. It is difficult to make an exact diagnosis of the condition; the absence of fetal heart-sounds after the injury is supposed by some to be indicative. In a case reported by Pritchard, however, the fetal heart-sounds continued to be heard, but when the abdomen was opened the uterus was found to be perforated and the intestine wounded in 6 places. The author, in discussing the mortality, excludes one case in which death occurred from a cannon-ball injury. Of the 17 remaining cases, 5 died and 12 recovered; 6 of the patients were not operated upon, and only 1 of these died; in 9 cases operated upon 3 died. Gellhorn thinks this mortality is misleading, although corresponding very closely to that of other statistics, since many cases of gunshot injuries of the pregnant uterus which terminate fatally are never reported. The effect of the injury upon the fetus was reported in 15 cases, and in 11 of these death occurred. The author urges early operation in all cases, and inclines to the view that a better result will be obtained by the Porro operation, although in a few cases in which the uterine wound is small it may be closed and an expectant plan of treatment carried out. [We are hardly prepared to agree with the writer in his suggestion of always removing the uterus in these injuries, since in the early months of gestation, and when the uterine wound is not extensive, we cannot but feel that the more conservative treatment of emptying the uterus and closing the wound is not only more likely to result in recovery, but is also the most rational form of treatment.]

Andrew B. Gloninger¹ reports an interesting case of **pistol-shot wound of the stomach, liver, and transverse colon in a woman 5 months pregnant.** The wound of entrance was about 1 inch to the left of the median line and 2 inches below the ensiform cartilage. The abdomen was opened in the median line. The ball entered the stomach through the lower portion, permitting the escape of a considerable quantity of partly digested food; then passed through the transverse colon, and finally through the lower lobe of the liver. The edges of the various orifices were cut away so as to remove all bruised and devitalized tissue, and the edges brought together with Lembert sutures of fine catgut. The cavity was thoroughly flushed and a drainage-tube introduced. The patient made an excellent recovery and was delivered of her child 4 months later.

¹ Phila. Med. Jour., Nov. 30, 1901.

X-RAYS.

L. Herschel Harris¹ contributes a paper on the **production and use of the Röntgen rays**. It is generally believed that they are transverse ether vibrations of a very short period, wave-like, and are produced by the bombardment of the anti-cathode by the highly charged molecules which form the cathode stream. According to the conditions of the experiment, nearly all the rays may pass through, or nearly all may be absorbed by, the tissues of the body. Success in radiography consists in proportioning the grade of the rays to the tissues which they have to traverse so as to produce the greatest amount of contrast. They must penetrate some of the tissues completely and others not at all. Thin structures are easy to skiagraph, but to obtain pictures of structures which lie at a considerable depth, such as renal or biliary calculi, the absorptive index of which is not very different from that of the surrounding tissues, is a difficult problem. In such cases a previous investigation with the screen should be made. With this instrument it is possible for the observer to seize upon the moment when there is some slight difference in the degree of penetration and a shadow is thrown for an instant upon an otherwise bright field. Often contrasts are obtained in this way which only last for an inappreciable space of time. A sensitized plate, on the other hand, records the sum of all the effects which have been produced since the beginning of the exposure. If the latter is prolonged, it may obliterate all that has been produced before. The rule therefore is: the shorter the exposure and the greater the volume of light, the better the result. For a skiagraph of the deeper structures, a tube with a high vacuum and a short exposure is necessary. In order of their penetration, the various calculi are arranged as follows: Biliary, uric acid, phosphatic, and calcium oxalate, the first giving the lightest shadows and the latter the most dense. One difficulty in obtaining biliary and renal calculi is the respiratory movements. This may be to some extent overcome by directing the patient to breathe deeply several times and then suspend respiration for as long as possible. During the respiratory movements the current is interrupted, it being only turned on during the periods of apnea, when the thorax is at rest. In the use of the x-rays a remarkable variability is noted; sometimes the abdominal aorta stands out distinctly, and again the falx may be seen through the cranium. Much may be gained toward securing these results by the manipulation of the tube. Soft tubes for soft tissues give the best results. The greater the distance of the tube from the plate, the better the definition. The further the tube from the plate, the longer the exposure, and a doubling of the distance quadruples the exposures. **Apparatus:** The favorite means of producing x-rays is a Ruhmkorff coil with a 10-inch spark. The best results are obtained with a mercury interrupter. The chief advantages of static machines are that they are at all times ready for use, and that they produce a steady, continuous flow of electricity of

¹ Australasian Med. Gaz., Jan. 25 and Feb. 20, 1902.

such character that the charge may be accidentally passed through a patient without causing injury. The direction of the flow of electricity does not change when once started, and the voltage is sufficiently high to excite tubes of great resistance. For screen work the lighting is constant, and there is no need of a costly and troublesome system of accumulators, rheostats, coils, contact breakers, and other complicated appliances. **Tubes:** A tube should be tried with a screen before it is purchased. A marked difference will be found between tubes of the same size made by the same makers and apparently similar. Moore gives the following as the points upon which to choose the tube: (1) The pencil of light from the cathode should strike the anticathode very near the middle; (2) as little as possible of the light should be behind the anticathode; (3) only a very little blue should be seen behind the anticathode; (4) the connections should be well made, the ends preferably having brass caps attached to the tube by plaster-of-paris; (5) a tube should show well on the screen with a 6-inch spark; but tubes that are best adapted for screen work do not make the best skiagraphs; (6) flaws in the glass are always weak points; (7) in choosing a tube by the screen, one should not be satisfied with a showing of the hand and arm, but the ribs or hip-joints should also be seen. It is well to have a number of tubes in order to select the best for the case under examination. All tubes have a tendency to increase in vacuum, which may become so intensified that no x-rays are produced. The actinometer, an instrument for measuring the penetrating power of tubes, consists of 12 squares of tinfoil placed on a thin board, the first consisting of one sheet only, the second of two sheets, and so on up to the twelfth square, which contains 12 sheets of tin-foil. Each square is fitted with a figure cut out of sheet-lead. If this board is placed between the tube and the fluorescent screen, we have an accurate means of estimating the penetrating power of the tube. **Sensitized surfaces:** The latest product is a Cadett x-ray paper, which is claimed to have great advantages over the plates because of its adaptability, its portability, its freedom from breakage, and because of the reduced time of the exposure. **Method of localization:** The principal apparatus for this purpose are those of Davidson and Hedley, the latter being accurate and complete, but costly. In all methods of localization the position of a foreign body must be ascertained by 2 skiagraphs. The position of the tube must be changed in the interval between the taking of the pictures, and the distance through which the focus has been moved must be ascertained. It is essential to know the points on the plate where it is met by lines drawn perpendicularly to it from the focus. The position of these points is ascertained by the use of a plumb-line, and in order to secure accuracy the plate must be leveled before the pictures are taken. In addition to the difficulty of using the plumb-line, there is the necessity of stretching 2 fine threads and measuring the position of the point where they cross one another. All these difficulties are overcome in the apparatus devised by Davidson. Recently Barrell has devised a simple apparatus consisting of 2 metal cylinders which are

placed upright on the plate during the exposure. After the first shadows of the cylinders are obtained they are shifted to the opposite end of the plate, and then the tube is again excited, giving rise to a second set of shadows from the foreign body and cylinders. Lines are drawn along the edges of the shadows of the cylinders and continued until they meet. This point is perpendicularly beneath the surface of the tube during the first exposure. By a similar ruling with other shadows, the focus in the tube in the second position is found. By drawing a line from each focal point to each shadow of the foreign body, the point of intersection shows its vertical position. Height above the plate of the foreign body is found by the formula $x = \frac{d}{d+l} h$, where the d = displacement of shadows of foreign body, l = displacement of the tube; and h = distance of focus from plate. The results have proved accurate within 0.03 and 0.04 of an inch. **Interpretation of skiagraphs:** More reliance should be placed upon the negative, as a number of details may be found in this way that do not appear in the finished proof. Bones and joints are subject to much distortion, due to their distance from the surface and the position of the focus of the tube. A skiagraph of the pelvis may be taken in such a way that various false appearances of deformity in the pelvic bones and femurs may be produced. **Focus-tube dermatitis:** This term is better than x-ray dermatitis because it does not commit us to any view of its origin. There is nothing specific in the inflammation which proclaims it as due to the focus tube. It resembles the dermatitis set up by a number of irritants. It is believed to be due to chemical rays similar to those found in the rays of the sun and the electric arc-light. Their detrimental action is determined largely by personal idiosyncrasy. **Visibility of the x-rays:** It has been computed that 1 person in every 800 is blind to the x-rays. The sense of light perceived in the normal eye is probably due to the fluorescence in the retina. In the treatment of **skin diseases** 1.5 amperes with 12-volt tension should never be exceeded. A too high tension on the pole-screws of the secondary coil of the transformer should be avoided, as well as too long and too frequent application.

L. A. Weigel¹ says the ordinary hand **stereoscope** is of little practical use, because, aside from the time and trouble involved in obtaining prints small enough for this instrument, much of the fine details of the original negative is lost in the reduction. The stereoscope shown in the illustration accompanying the article is adapted for studying the original negatives. It is constructed on the principle of the reflecting stereoscope invented by Wheatstone, in which 2 plain pictures representing slightly different views of an object are superimposed and appear to the eye as giving the same relief as the object itself. It consists of a bedpiece upon which, at its center, two mirrors, inclined to each other at an angle of 90 degrees, are mounted on a slide having a forward and backward movement, to facilitate adjustment. At the

¹ N. Y. Med. Jour., Nov. 16, 1901.

angle formed by the mirrors a screen with openings for the eyes is placed. Two grooved frames for holding the negatives face the mirrors and are adjustable by a simple sliding motion in 2 directions, one at right angles to the base, the other parallel to it. In the base of these frames there is also a mechanism, controlled by a milled head-screw, for vertical adjustment. By means of these various movements the images of the 2 negatives reflected in the mirrors may be quickly adjusted until they are accurately superimposed, and stereoscopic relief obtained. A 16-candle-power lamp is placed behind each negative. For concentrating the light on the negatives, an ordinary metal shade or a reflector surrounds the electric-light bulb, which should preferably be of ground glass. An even diffusion of the light is still further secured by having one side of the negative frames covered with a sheet of ground celluloid, which is lighter and less fragile than ground glass. A Welsbach gas lamp or an acetylene bicycle lamp may be substituted for the illumination.

J. Rudis-Jicinsky¹ states that if you wish to make a **skiagraph of the muscles, ligaments, bones, and arteries**, place two or more sensitized x-ray plates, with the film sides up, in a casket or within yellow or black envelopes. Use two Crookes's tubes, one under your subject and the other over the same. The tubes must be of about the same vacuum. All the plates will be affected, but in decreasing degree. A calcium tungstate intensifying screen of very fine grain may be placed against the film of one plate to show the internal structure of the bones, muscles, and ligaments. To have still better contrast, and sometimes to see the arteries also, a lead plate about $\frac{1}{2}$ or 1 inch in thickness may be placed under the photographic plate as a support. This plate seems to act between the two Crookes's tubes as another and new cathode. When photographing thick parts of the human body, such as shoulders, chest, pelvis, or buttocks, which necessitates a great distance of the tube from the object, two intensifying screens are recommended, for the purpose of reducing the time of exposure. The prepared side of the screen is placed against the prepared face of the photographic plate. Then the plate is placed, together with the screen, in a casket or wrapped in envelopes. The sensitive side of the plate, together with the screen, lies upward. For precluding the diffused x-rays, use a lead box with diaphragms. The x-rays undergo against all substances a strongly diffused reflection, the consequence of which is that, at the corners or edges of an insusceptible substance, the rays appear diffuse. This diffused reflection of light is particularly strong in the flesh of a person under operation. From every minute part of the flesh exposed, rays are independently directed from the tube upon the dry plate, and this is the reason that photographs of the buttock appear sometimes with so little contrast. To obviate this evil, care must be taken not to illuminate a greater part of the body than appears absolutely necessary to bring the entire plate used under exposure. By imagining the tube to be at the distance of 60 cm. from the plate, it

¹ N. Y. Med. Jour., Mar. 22, 1902.

will be clear that, by introducing a diaphragm of lead at a distance of 30 cm., a hole of only half the size of the plate will be necessary to direct the operating cone of rays upon the plate with their full effect. For this purpose the writer has made a lead box with interposed diaphragms, with a receiver for the tube in the form of a fluoroscope, whereby such work as is here described is accomplished much more easily.

L. G. Cole¹ describes a **new method for locating foreign bodies by means of the x-ray**. An examination is made with the fluoroscope. If the foreign body be detected, place two coins (dimes), one on the anterior, and the other on the posterior aspect of the body, so that a ray of light passing vertically from the anode would pass through both coins and the foreign body, thereby all casting one shadow on the fluoroscope. Remove the coins and mark their position with silver nitrate. To ascertain how far the foreign body is from the surface, place the plate in apposition to the body at the posterior mark, then place the anode directly above the anterior mark. If one has been able to detect the foreign body and arrange the coins during a fluoroscopic examination, the tube will already be there; if not, drop a plumb-line from the anode to the anterior silver nitrate mark. Note the distance of the anode from the plate. On this plate make two exposures, moving the tube for the first exposure a short distance from its present position. For the second exposure move it exactly the same distance from its original position, but in the opposite direction. Note this distance. This may be done by marking on the surface of the body two points equally distant from the original silver nitrate mark and in directly opposite directions, using a plumb-line to place the anode over these marks. Now one has two shadows of the foreign body on one plate; develop the plate regardless of everything except these two shadows. Using the distance between them, one can ascertain the distance of the foreign body from the surface.

Carl Beck² presents a number of **skiagraphs illustrating the differential diagnosis of various diseases of the osseous system**. He points out that the x-rays will early diagnose osteomyelitis and will demonstrate every focus of the disease. Necrosis is distinctly pictured and a sequestrum is defined even when it is impossible to feel it with a probe. The skiagraph of a periosteal sarcoma is characteristic in that it shows fine spiculated trabeculas which radiate from the surface. Soft sarcomas of the medulla show the absence of osseous tissue. An osteosarcoma proper shows more osseous tissue than the preceding variety, but its outlines are very irregular. The appearances of osseous syphilis, tuberculosis, and cysts are characteristic. Other osseous diseases, such as osteoma, osteomalacia, rachitis, and chondroma, also offer some skiagraphic peculiarities in proportion to their various textures. Osteoma shows the shape of the osseous deformity, but there is a normal architectonic structure. On account of the dissolution of the calcareous salts, osteomalacia is, like rachitis, distinguished by the absence of an osseous shade. In contradistinction to osteosarcoma, the whole

¹ Med. News, Mar. 15, 1902.

² Jour. Am. Med. Assoc., Jan. 4, 1902.

bone appears translucent. In chondroma there is a regular light-shaded area of lobular shape according to its cartilaginous character. Metastatic carcinoma in bones can also be represented.

C. B. Ferguson¹ reports a case of **recurrent carcinoma of the breast which was markedly benefited by x-ray treatment**. Both the sternum and axilla were infiltrated with the growth. The rays were employed on 20 successive days, the applications lasting 20 minutes. The growth had shrunk much in size and the pain and ulceration had disappeared at the time of the report.

Peters² publishes the notes of a case of **recurrent scirrhus of the breast treated by the x-rays**. Ten applications were made at intervals of about 3 days, the exposures lasting from 10 to 20 minutes. The diameter of the growth decreased from 3 to 1½ inches. The ulcer became smaller and the pain and discharge markedly lessened. At this period the patient developed a fatal croupous pneumonia.

Wm. A. Pusey³ reports 3 cases of **sarcoma treated by the x-rays**. The first case was that of a young man from whom some enlarged cervical glands had been removed, and which proved to be small round-celled sarcoma. Six weeks after the beginning of the x-ray treatment there was no trace of disease except a small painless lymphatic gland; the circumference of the neck had decreased from 21 to 6½ inches. The other 2 cases were in old men with extensive growths; in these the rays had but little effect. Pusey also reports a case of **Hodgkin's disease** in a boy 4 years of age which was **markedly improved by the x-rays**. In a second case of Hodgkin's disease the rays were applied to the epitrochlear gland, which shrunk from the size of a goose-egg to that of an olive as the result of the treatment. During the same period arsenic had been injected into the axillary glands without producing any benefit. Pusey⁴ also reports the results of x-ray treatment of tuberculosis on the skin, epithelioma, carcinoma of the breast, deep-seated carcinoma of the head and neck, sarcoma, keloid, and other conditions. His conclusions are as follows: (1) It is painless. (2) It destroys diseased tissue, but leaves the healthy tissue in its place. (3) It leaves small scars. (4) It can be used in cases in which the surrounding healthy tissue cannot be sacrificed. (5) Hence, it is available for cases in which ordinary methods involve extensive operations and serious subsequent disfigurement, as, for example, about the eye and nose. (6) It is available in cases in which ordinary methods are impossible because of the amount of destruction of tissue which complete removal would require; in other words, it is applicable to many inoperable cases. (7) It often relieves pain. As a general proposition, the use of x-rays should be limited to those cases which for any reason it is inadvisable or impossible to treat by ordinary methods. In other words, until our experience with x-rays extends over a longer time, their use should be a reserve-method of treatment. With the present evidence of the effect of x-rays upon malignant neoplasms, we are justified in maintain-

¹ Brit. Med. Jour., Feb. 1, 1902.

² Brit. Med. Jour., Mar. 1, 1902.

³ Jour. Am. Med. Assoc., Jan. 18, 1902.

⁴ Jour. Am. Med. Assoc., April 12, 1902.

ing the following propositions: (1) In all cases of malignant disease which have been operated on, there is reason to urge the subsequent use of x-rays as a prophylactic measure. (2) In all inoperable cases of malignant disease the x-rays should be tried. (3) In all such cases there is a probability of relieving pain and a possibility of inhibiting the progress of the disease.

George G. Hopkins¹ advises the use of **x-rays in early cases of carcinoma** where the disease is as yet only local in its manifestations. He uses a soft tube and a static machine. The exposures have been reduced from 30 to 15 and 5 minutes, more often the latter period. The healthy parts surrounding the growth are protected by several layers of lead-foil. The distance of the tube from the patient varies from 12 to 30 inches according to the effect desired. The errors to be avoided are too long exposures, too short a distance between the tube and the patient, and improper apparatus. The theory on which the use of the soft x-ray tube is advocated is that its power to produce changes in tissues must be in proportion to the resistance which the cells of the tissue to be acted on offer to any destroying agent. Theoretically, the longer wave of the soft tube, as compared to the harder tube, has more destroying and disintegrating effect. Carcinomatous tissue is composed of embryonic cells whose molecules are unstable, and can be easily destroyed or made to take on a new arrangement. This new grouping either destroys these diseased cells completely, or makes them take on a healthy action, thus stamping out the disease. The same writer² now treats uterine carcinoma with the Finsen light as well as with the Röntgen rays. He finds that the actinic rays derived from the Finsen tube will control the hemorrhagic condition much more promptly than anything he has ever used. In visceral cancer he prefers a hard tube because it produces trophic disturbances in the deeper tissues without causing any damage to the superficial parts. Carcinoma of the stomach has been brought within the curative influence of Röntgen fluorescence. In these cases it is better to err on the side of short exposures, as too long séances may do serious damage to the patient.

S. W. Allen³ reports 8 cases, in all of which a distinct **analgesia** followed within 48 hours of an **x-ray** examination. The cases were as follows: Rheumatoid arthritis, epithelioma of the nose, sinus of the shoulder, Pott's fracture, punctured wound of the foot, ulcer of the leg, tuberculous sinus of the neck, and ulcer on the dorsum of the foot.

Huntington⁴ reports a case of **x-ray burn** of the abdomen which he **cured by excising the diseased area** together with the subjacent fat and applying Thiersch skin-grafts to the resulting raw surface. [Our own experience in the treatment of deep x-ray burns has been so unsatisfactory that this operation would commend itself as worthy of trial.]

E. A. Codman⁵ concludes a **study of the cases of accidental x-ray burns hitherto recorded** as follows: (1) The frequency of x-ray injuries

¹ Phila. Med. Jour., Sept. 7, 1901.

² Phila. Med. Jour., April 5, 1902.

³ Amer. Med., Mar. 22, 1902.

⁴ Ann. of Surg., Dec., 1901.

⁵ Phila. Med. Jour., Mar. 8 and 15, 1902.

has been much exaggerated by the medical press owing to the wide publicity given to many early cases. (2) Codman has been able to collect somewhat less than 200 cases, less than half of which were serious, and about one-third of which occurred in x-ray workers. (3) Judging from the experience with these injuries in Boston, it is his opinion that a fair proportion of the severe burns are included in this series, while the dermatitis of skiagraphers is less well represented. (4) At a maximum estimate it is safe to say that not one patient in a thousand has been injured in the past five years by an x-ray examination and in the past year not one in ten thousand. (5) More than two-thirds of these injuries occurred in the first two years of the use of the x-ray. Only one mild case is reported as occurring in the current year, those cases in which the exposure has been made for therapeutic purposes being excluded. (6) The cause of x-ray injuries is not definitely known. It is some form of energy closely allied to the photographically active x-ray and radiates with it from the platinum terminal. (7) The primary injury is to the nerves controlling the nutrition of the skin. (8) There is no good evidence of injury to the deeper tissues without primary interference with skin. (9) The important factors which contribute to the production of x-ray burns are: the intensity of the current used to stimulate the tube; the quality of the tube; the distance and time of exposure; the idiosyncrasy of the patient. (10) The static machine is somewhat less likely to produce injury than other forms of apparatus. (11) From the data of the reported cases we can say that no burn has been produced by an exposure equal to or less than the equivalent of 5 minutes at 10 inches. (12) It is impossible from the data to say how intense an exposure must be to produce a burn, for a comparison of the cases shows that an inconstant factor or factors exist. (13) These inconstant factors are more likely to lie in the complex human organism than in the less complicated construction of the tube. (14) General experience has shown that soft tubes produce a more intense effect on the tissues than hard. (15) While we cannot control these inconstant factors, therapeutic exposures will continue to be dangerous, and it is therefore important to record the exact conditions of the patient's local and constitutional idiosyncrasies, as well as those of the tube. (16) In cases of injury the time before the appearance of the first symptoms has varied from a few minutes to 3 weeks. Five cases have remained latent for over 3 weeks; 2 of these for 5 months. (17) It is impossible to predict the severity of the lesion from the time of its appearance after exposure. (18) Codman suggests 10 minutes, at 6 inches from the platinum terminal, as a standard therapeutic exposure. This will make comparisons between the inconstant factors easier. (19) Unless signs of dermatitis appear within 3 weeks after the exposure, they are unlikely to appear at all. In one-third of the reported cases the appearance occurred within the first four days; in one-half the cases before the ninth day. (20) In the ordinary x-ray examination with fluoroscope or skiagraph, the operator takes the entire responsibility of injury; in exposures for therapeutic purposes the patient shares the responsibility.

Carl Beck¹ describes the pathology of the tissue changes caused by the Röntgen rays, and refers to the treatment of malignant disease by means of this agent. He suggests that there might be distinguished 3 different degrees of x-ray burns. The first degree is characterized by hyperemia, local rise in temperature, exfoliation in small scales, and a tormenting itch in the skin. Effluvium capillorum belongs to the same category. The second degree is characterized by the formation of blisters. In the third degree the tissues become gangrenous. The greatest difference between ordinary burns and those produced by the x-ray lies in the period of incubation, the latter not appearing, as a rule, before the lapse of about 2 weeks. Beck mentions the marked idiosyncrasy possessed by some individuals and the remarkable immunity which others show toward x-ray burns. Microscopically the walls of the blood-vessels are found to be thickened, thus causing a starvation atrophy of the cells. Beck reports a perfect cure of a case of lupus erythematodes after 25 exposures. Concerning the influence of the Röntgen ray on carcinoma, he says that all integumental forms of cancer are accessible to Röntgenotherapy, also the tongue and cervix uteri at an early stage; he regards it as extremely unwise, however, to leave to the rays what can be done much quicker and more effectively with the scalpel. He suggests that irradiation should be begun as soon as union is perfect after the removal of a neoplasm, and should be kept up for a period of several weeks, in order to destroy any carcinomatous cells which may be left. "As to the technic of Röntgenotherapy, it is advisable to expose for 5 minutes first, and after a week for about 10 minutes. If, after a third exposure (2 weeks after the first exposure), no reaction follows, the patient apparently shows no idiosyncrasy. Then he may be irradiated every second or third day, at last daily, unless intense reaction shows. During the tentative exposures the distance of the tube should be 4 inches, later on it may be 1 inch only. Some patients like the direct contact with the tube, and I have seen no harm from it in resistant individuals. A shield of lead must be fastened around the area to be irradiated in nonmalignant disease, and especially if the face is concerned. It may be attached by a bandage. To the uneven surface of the margin, tin-foil or a piece of cork may be added. Corresponding with the area to be irradiated, a hole is cut in the shield. In the treatment of neoplasms, however, the use of a shield is improper, since it is intended to have the influence of the rays extend as far as possible."

Francis H. Williams² presented to the Massachusetts Medical Society, June 12, 1901, photographs of a number of patients before and after treatment of epithelioma, rodent ulcer, and plasmona by means of the x-ray. He thinks we have got far enough to justify the use of x-rays in early operable cases of cancer, and to teach the community that these growths may be healed by harmless and painless methods, thus allowing few of them to advance to serious dimensions through

¹ N. Y. Med. Jour., May 24, 1902.

² Boston M. and S. Jour., Sept. 12, 1901.

delay from fear of the knife. The first effects of the x-rays are apparent within 2 or 3 weeks, or in some cases within a few days.

Wm. J. Morton¹ concludes a paper on **radiotherapy** for cancer and other diseases as follows: "(1) Radiotherapy broadens our conceptions of the possibilities of the therapeutics of modern medical science. (2) The x-ray has a general application for the relief of pain. (3) As to technic, a standardization as to apparatus and its capacity, and as to duration and frequency of treatments and distance of the tube, is recommended to operators. (4) The x-ray has a curative effect in internal cancer and other internal diseases. (5) For superficial diseases a medium soft tube may be used, for internal cases a hard tube. The hard tube is applicable, however, in all cases. (6) X-radiation is recommended prior to any operation, to clear the tissue of cancer particles and foci, and to circumscribe the disease. (7) X-radiation is recommended after operation to preclude a recurrence. (8) X-radiation may be recommended in place of an operation, and may be preferable to one for the reason that operation secures but a comparatively moderate percentage of permanent recoveries, and because up to date the x-ray procedure shows a continued improvement in cases, and a percentage of cures which will, undoubtedly, compare favorably with surgical operations. (9) There is danger to the patient or uncertainty as to what might be accomplished when the x-ray is employed by immature operators. (10) In x-radiation we possess more clearly a solution of the problem of curing cancer than by any other method of treatment."

¹ Med. Rec., May 24, 1902.

OBSTETRICS.

BY BARTON COOKE HIRST, M. D., AND W. A. NEWMAN
DORLAND, M. D.,
OF PHILADELPHIA.

PRELIMINARY AND GENERAL CONSIDERATIONS.

The Midwives Question.—[During the past year medical England has been deeply agitated over the Midwives Bill, which was discussed very thoroughly by the House of Commons. In common with our English brethren, we in America have taken more than a passing interest in this important question. A comprehensive report of the discussion on the second reading of the bill is to be found in the "British Medical Journal" of March 1, 1902, and the "Lancet" of March 8th. The opinions in favor of the bill are forceful and honest, but we are strongly in accord with the editorial on the subject in the "Lancet" of March 8th, a portion of which we insert here.] In commenting on the discussion in Parliament, it remarks that a careful perusal of these speeches must lead all medical men to the conclusion that the latest edition of the Midwives Bill has exactly the faults which its promoters at different times declared that it had not. It tends to set up an inferior order of general practitioners, and it is no great exaggeration to call it an infringement of the Medical Act. Lord Cecil Manners and Mr. de Tatton Egerton, respectively the proposer and seconder of the second reading, did not disguise this fact. The former spoke of the bill as "putting the profession of midwifery on a par with the profession of medicine," and the latter approved of the absence of any regulation obliging midwives to take out an annual license on the ground that "doctors did not have to take one out." Mr. Heywood Johnstone, speaking in a similar strain, considered that certain midwives would find it a humiliation to take out a yearly license. Clearly all three speakers demand for the midwifery nurse the dignity of a professional status. They hold that because medical men, a highly educated body with a strict professional code and a recognized social position, are under no local control, the midwifery nurse should be equally exempt. Sir John Batty moved the rejection of the Bill in a sound speech. While he agreed with Lord Cecil Manners that the opposition to previous Midwives Bills has been due to difference of opinion on the precise legislation required rather than to disapproval of the general principles of the measure, he found that the present Bill did not go far enough to be practical. A bill which does not penalize the work of the uncertified midwives seems to us to

leave the parturient poor at the mercy of exactly those Gamps whose calling it was supposed to be the object of the Bill to suppress. The subject of the Midwives Bill is one that has been growing steadily in complexity for the last 40 years. We hope that the Grand Committee on Law will perceive that Dr. Farquharson's opinion cannot be taken as representing medical feeling. In all the circumstances of the promotion of this Bill we do not hold out much hope to our readers of obtaining the modifications in it that are, in our opinion, necessary. The medical profession have not been united upon the subject, and the more temperate and influential critics of the different measures that have been before Parliament have been hampered by the violent language of those who are opposed to all legislation. As a result medical opinion and the opinion of the General Medical Council have not weighed with the legislature as they should have done. [We agree most heartily with one of the writers on the subject that the poor should have the services of fully qualified medical practitioners and nurses as well as the rich. The placing of these illiterate and often offensive creatures on an equal standing with the young graduates of colleges is an affront to the profession. As proved by M. J. Lewi,¹ the midwife evil is well shown by statistical returns from New York city. Of 80,735 births reported during the past year, 42,253 were in the practice of physicians, and 38,482 were cared for by midwives. We would suggest that the municipal government employ annually young men graduates of medical colleges to attend to the city poor in labor, just as they now employ vaccine physicians. Those desiring their services could, by applying at the proper office, register and prove their rights to free medical attendance, and could then be referred to the qualified attendants for their district of the city.]

Increasing Sterility of American Women.—G. J. Engelmann,² of Boston, read a paper on the subject of the increasing sterility of American women at the annual meeting of the American Medical Association held in June, 1901, basing his conclusions upon the numerous cases carefully investigated by himself, the conclusions being confirmed by independent investigators, such as Wilbur, of Michigan, Abbott and Kuszynsky, of Massachusetts, and by the studies made by Chadwick, of Boston, of the records for that city of the eighteenth century. The various results closely conformed to one another and substantiated the accuracy of the whole. The main facts and conclusions were as follows: (1) The sterility of women has increased, and their fecundity has diminished, in the United States to an excessive degree of late years. Thus, in the eighteenth century 2 % of American women are recorded as sterile, while the average fecundity was 5 children to each married woman. "At the present day the sterility of the American woman is greater, and her fecundity less, than that of the women of any other nation except France." Thus, in St. Louis, 21 % of women of the laboring classes are sterile, the proportion rising to 24 % among women

¹ Buffalo Med. Jour., Mar., 1902.

² N. Y. Med. Jour., July 20, 1901, and Phila. Med. Jour., Jan. 18, 1902.

of the higher classes. In Massachusetts the ratio is 20.2 % generally for women, and in the city of Boston it is 23.7 % in the laboring classes. (2) The fecundity of American women was 5 children to a family in the eighteenth, 4 to 5 in the beginning of the nineteenth century, "and now at the end of that century it is between 1.8 and 2.1 to a family." The exact figures are 2.1 in Missouri, 1.8 in Michigan, and 1.8 in Boston for native American women. With regard to occupations and professions, the interesting fact is recorded that fecundity is lowest among women graduates of colleges, the proportion being 1.3 for each woman. (3) Comparing these figures with those obtained from the immigrant Irish population, it is found that a high ratio of fecundity prevailed among Irishwomen, the figures being 4.2 for St. Louis, 3.5 for Boston, and 5 for Michigan. For German women the figures were also high—viz., 3.4 for St. Louis and 6 for Michigan. The fecundity for all foreigners in Massachusetts was 4.9. (4) Engelmann records his conviction that an increase of secondary or artificially induced sterility (prevention of conception by chemical and physical measures) is largely responsible for the results among American women. Miscarriages, too, are correspondingly frequent—viz., 10 miscarriages on an average in 27 labors among native-born American women, the proportion being the same among negro women. There is not an increase of primary sterility from gonorrhea, uteroovarian disease, and the like among American women, thus confirming the previous conclusions that the increase of sterility is due to artificial measures and not to primary disease. (5) The ratio of primary sterility in American women during the eighteenth century was 2 %, that of Russia is at present 2.8 %, and that of Norway 2.5 %, these figures giving the average proportion in peoples of good moral and physical health. Engelmann concludes that wilful and self-inflicted sterility is the cause of the relatively low fertility of women in America and other countries, and affirms his conviction that the ultimate results are an increase of suffering in women who give themselves up to it, apart from the national evils which may follow in the train of depopulation should the practice become more numerically prevalent and compensating causes be removed.

The Registration of Stillbirths.—An editorial in the "Philadelphia Medical Journal," August 17, 1901, remarks that now and again the attention of the profession is called to some irregularity in the registration of infants that are stillborn. This is especially true of England and the continent, although it cannot be claimed that we in this country have by any means arrived at a degree of perfection in this respect. It is a matter of congratulation, however, that in many American cities within recent years it has become compulsory not only to make a return of all stillborn children, but that each blank must be made with a special name, thereby rendering still more accurate the vital statistics of the community. To those who will give the matter serious attention it will be quite obvious that more important aspects are concerned than would at first sight appear. It is not merely for the purpose of perfecting the country's vital statistics, important as this undoubtedly is, that careful

registration is imperative, but there is a medicolegal side of the question that deeply concerns the welfare of the country. Under lax laws and regulations the nefarious craft of the criminal abortionist and incompetent and conscienceless midwife is so protected that crime becomes rampant, and open defiance of moral legislation results. In England, as was testified to recently in an editorial note in the "British Medical Journal," the matter has advanced to such a degree of laxity that children who die within 24 hours of birth are constantly received in the cemeteries and buried as "stillborn." This is undoubtedly a boon to the indigent among the people, who are thereby spared the expense of a funeral service, but the dangers of such a course are evident. Not only may the products of criminal interference thereby be legally (?) disposed of, but infanticide is actually fostered and the way made plain and easy for evasion of an important safeguard of the stability of the people. There is already enough of ill resulting from the countenancing of incompetent midwives without magnifying their evil effects by opening to them a safe way for increasing their ill-gotten gains through illegal concealment of births and deaths. After the period of fetal viability has been reached, legislation that would make compulsory, under penalty of fine or imprisonment or both, the registration of a premature birth is most desirable. Such children, designated by a Christian name and the surname of their father, should receive legal interment, and the records of births and deaths thereby be rendered so much the more complete for the given community. It would be gratifying and, we believe, beneficial in results, both statistically and morally, if some method could be devised whereby an accurate registration of all ovular and embryonic births prior to the period of viability could be obtained or even made compulsory. In order to arrive at some satisfactory and accurate records of fecundity, the many prematurely ended pregnancies must be taken into consideration.

Placentophagy and Placental Opothrapy.—An editorial¹ says: A remarkable communication of high biologic interest was published in the March (1902) number of "L'Obstétrique." M. Bouchacourt, the author, makes public some clinical notes on the effect of "chorionine," a preparation from sheep's placenta, in cases of absent or defective lactation in parturient women. The principle on which he acts is explained by the title of his short treatise, which is "De l'Utilisation Naturelle de la Partie Extra-embryonnaire de l'Œuf." This utilization of the extra-embryonic portion of the ovum is understood very literally by many of the lower animals. Birds naturally eat up the eggshells of the offspring they have hatched. Bouchacourt observed for years a large dove-cote which lodged about 200 pigeons. Never could he find a trace of an eggshell outside or inside the nests. Hens also devour their chickens' eggshells, and for various equally bad reasons farmers' wives in many countries endeavor to prevent the fowls from following a natural instinct; yet the shells of the eggs eaten at the table in the very same farms are thrown on to the dunghill, where the hens soon find them

¹ Brit. Med. Jour., April 12, 1902.

and devour them. Among the mammalia the eating of the placenta by the mother is a very natural custom. We will not go so far as to suggest, as Bouchacourt seems to do, that this habit can be traced to the female spider, who eats up the male if she can catch him, directly after impregnation. He seems to be useless, like the drone, after he has discharged the only duty for which he is fitted, and so is made by his lady into an aliment for the benefit of the future of the species. Though female mammals do not eat up their swains, they often devour their young, and Bouchacourt notes that this is common in captivity. Cats and sows are very prone to this vice, also prevalent among rabbits and guinea-pigs. Countrymen fancy, apparently with reason, that the suckling pig is not safe from his mother's jaws till it has taken the teat. The author believes that the sow, feeling an appetite for something uncertain, sometimes makes an error in diagnosis and eats one of her young instead of the placenta, but when lactation is excited by the litter her appetite guides her more accurately. Among the human species placentophagy is not unknown. It is practised chiefly, of course, among certain interesting tribes which have no manners and whose customs are objectionable. Among the Yakouts the father and his friends used to eat the placenta ceremonially, but this practice was recorded in 1719 by Carreri, so it may have fallen into desuetude like so many other more picturesque customs. Raynaud, of Algiers, writing as lately as January, 1902, declared, however, that in certain parts of the Soudan placentophagy is habitually practised, though the peasantry of Morocco and Algiers know nothing of it. The origin of this instinct has been much disputed. In the human species it has nothing to do with the sacrifice of infants, which is a well-known practice designedly for propitiation, and traceable in the early history of Aryan, Semitic, and other nations.

THE PHYSIOLOGY OF PREGNANCY.

The Determination of Sex.—Kuester¹ has made accurate observations for a number of years regarding the possibility of influencing the sex in conception, and has also done some experimental work in the families of friends. He considers the production of a female child to be the rule in all cases in which sexual congress takes place frequently after the cessation of the menstrual flow, and fecundation occurs then; on the other hand, if the intervals between coition are longer, impregnation occurring from 10 to 20 days after the cessation of the menses, a male child is the rule. In addition to his own observations, he bases these statements upon the frequency of the first-born being a male child, explaining this by the fact that marriages are solemnized about the middle of the period; by the frequency of boys being born in reigning houses; in which marriages are usually the result of politics and convenience, and by the frequency of girls when love is the main factor in the marriage. Cases to which this rule is not applicable, he explains

¹ Klin. Therap. Woch., Jan. 9, 1902.

by the difference in age of the couple, the possibility of an old ovum becoming impregnated instead of the one recently shed, etc.

Fetal Placental Circulation.—[The relation between the circulation of the maternal and fetal blood within the placenta has long been an interesting subject, and has lately been settled beyond reasonable doubt on the point that the blood of the mother does not enter the vessels of the child.] B. S. Schultz presents an interesting and simple method of proving this fact. A fresh placenta is taken and floated upon a dish full of warm water with the maternal surface uppermost. The umbilical vein is dissected out of the cord and provided with a cannula. Through this warm milk is run until a high degree of pressure is obtained. It will then be found that the exposed surface of the placenta is entirely free of milk, although the pressure of that fluid has been sufficient to squeeze out blood from the vessels of the maternal surface. It will be found that the placenta will erect itself, so to speak, take on the full form which it had in the uterus, even to becoming convex toward its fetal aspect. While making these changes in position and form blood will continue to flow from the vessels of the maternal surface, but milk does not escape. Furthermore, the separate cotyledons of the organ begin to appear discrete from each other and still the injecting fluid remains entirely within the fetal circulation. If at this point one of the cotyledons is cut with a knife, an active stream of milk with oozing will appear. It is best to select the vein for this injection because of its comparatively wider distribution in the organ than the arteries themselves, and also because its lumen remains comparatively larger than the lumen of the arteries and therefore permits the milk to flow more freely. This is a simple and effective means of demonstrating that mother-blood and child-blood are separate throughout intrauterine life. It therefore follows that when the child perishes through early separation of the placenta from the uterine wall, death does not occur through lack of blood, as has ordinarily and for many years been held. When such separation occurs, the child does not lose a single drop of blood. Similarly, when a child is born apparently dead from the same cause, it is not from hemorrhage, but rather from deficient aeration of the blood that its condition is at all serious.

The Lower Uterine Segment.—Smyly² contributes an interesting paper upon this subject. He finds in existence 4 theories regarding the lower uterine segment: One, that it develops during pregnancy from the lower part of the body of the uterus; another, that it develops from the upper part of the cervix; third, that it is formed from the cervix uteri, and a fourth, that it is developed from both the body and the cervix. It seems probable to him that it is developed from the upper portion of the uterus during pregnancy. He calls attention to its clinical importance during labor, and believes that it prevents the rupture of the membranes by receiving a part of the force of the uterus which otherwise would be expended upon the membranes. During the third stage, when the uterus expels the placenta from the contractile portion, the

¹ *Centralbl. f. Gynäk.*, Dec. 7, 1901.

² *Brit. Med. Jour.*, May 18, 1901.

lower segment becomes distended and can be easily felt above the pubis. In delivering the placenta, it is best to wait until the uterus has separated from its wall and until it can be appreciated in the lower uterine segment above the pelvic brim. In abnormal labor, if the lower segment be badly developed, the force of pressure is received by the membranes, which rupture prematurely. When the lower segment is closely applied to the fetus, as in normal cases, it is impossible for the umbilical cord to prolapse, no matter how contracted the pelvis may be. In deformed pelves the cord will not prolapse so long as the lower uterine segment remains tightly applied to the presenting part. It is not the contour of the pelvis which determines the prolapse of the cord, but the presence or absence of the uterine segment. In placenta prævia he advises the treatment proposed by Robert Barnes. He would rupture the membranes, bring down a foot, and allow the case to proceed naturally. While this method sacrifices the child in many cases, it is safest for the mother, and most efficient. In cases in which the head has passed through the cervix, it can better be delivered by forceps. Where the os is not sufficiently dilated to admit two fingers, this sort of version cannot be carried out. He has never seen a case of placenta prævia in which two fingers could not be carried through the os and cervix, and the condition must be a very rare one. In rupture of the uterus the lower uterine segment becomes extraordinarily thinned, and the fetal part can be felt through the uterine tissue with remarkable plainness. It occasionally happens that the contraction ring at the junction of the upper and lower segments of the uterus forms an obstacle to labor. The use of narcotics and patient dilation with the hand are usually sufficient in these cases.

The Pregnant Uterus in Situ Postmortem.—[The effect of the pregnant uterus on the rest of the viscera of the abdomen is important, and thus far our knowledge of it is gained chiefly from frozen subjects.] J. G. Moorhead¹ reports the findings in the dissection of a cadaver in the seventh month of pregnancy in which the organs were hardened *in situ* with formalin. On opening the abdomen the uterus was found to be inclined to the right, radiated on its own axis, thus bringing the left ovary and tube against the abdominal wall and the right appendage against the cecum. The summit of the uterus was 10 inches above the symphysis pubis, overlapped by the transverse colon and the great omentum. The anterior surface of the uterus was in contact with the abdominal wall in front, and posteriorly the organ was molded on the cecum, right kidney, the vertebral column and the terminal part of the ileum. The peritoneum covering the uterus appeared to be of normal thickness. Traced down its anterior wall it was reflected to the back of the symphysis half an inch above its upper margin, where it met the upper margin of the bladder. On each side the membrane was reflected on to the iliac fossa, corresponding here to the base of the broad ligaments. Posteriorly it passed to the rectum at the level of the fifth sacral vertebra; hence it was practically unchanged from its relation in the

¹ Med. Press and Circ., Feb. 12, 1902.

nonpregnant state. Anteriorly at first sight it seems to be raised, but on consideration it will be seen that it kept its original relation to the uterus, and appears to be raised owing to the hypertrophy of the organ. The bladder remains behind because it does not hypertrophy. The tubes lay in close contact with the uterus, owing to the bending out of the layers of the broad ligaments. The veins of the broad ligaments, especially the ovarian, were very much dilated. The greater part of the small intestine was found to the left of the uterus. A small length of the small intestine extended half above the organ and beneath the transverse mesocolon. The pelvic diaphragm was not hypertrophied and some support seemed to have been given to the uterus by the obliterated hypogastric arteries, which suspended the organ somewhat like a hammock. The bladder was in relation with the lower part of the uterus, triangular in shape, empty, with its apex directed upward behind the symphysis, and with its base on the anterior wall of the vagina just in front of the place where the uterus pierces it. The anterior wall was convex from side to side and from above downward, and the posterior was concave and molded on the uterus. There were, in addition, pressure effects noticeable in the veins and in the right ureter. Other than this there were no special changes in the organs.

Protracted Gestation.—[The degree to which the duration of pregnancy can be prolonged has always been a matter of great interest.] A very remarkable case of this kind is recorded by G. H. Hames,¹ in which 320 days had elapsed from the last day of the last period to the day of delivery. Estimating the duration of pregnancy from the last day of the period is always open to the fallacy that the patient may have become pregnant either immediately after the cessation of the last period or just before the period failed to appear. If, however, we examine the data obtained from observations upon animals in which the date of a single coitus can be accurately determined, we find very wide differences in the duration of gestation. Spencer and Tessier, from observations upon 1303 cows, found that the calves were dropped from the two hundred and fifty-third to the three hundred and twenty-first day after coition—a difference of 68 days. Similar observations carried out by St. Cyr upon mares showed a difference of as much as 87 days between the duration of the shortest and the longest pregnancy. In the case of the human subject statistics based upon a single coitus are always untrustworthy, but Nunnez-Ressié has recorded the case of a girl who gave birth to a child 317 days after she had been raped. Large numbers of cases of prolonged gestation have been recorded both by the old medical writers and in many of the modern works on jurisprudence. Joh. Johnston quotes Paschal as relating an instance of birth after a pregnancy of 23 months, Aventium one after two years', and Mercurialis one after four years' gestation! A case was decided in the Supreme Court of Friesland in 1634 in which a child born 333 days after the death of the husband was pronounced legitimate. As Gould tells us, the Parliament of Paris was gallant enough to come to the

¹ *Lancet*, May 25, 1901, p. 1496.

rescue of a widow and save her reputation by declaring that a child born after a 14 months' gestation was legitimate. Campbell says that Simpson met with cases of pregnancy lasting 319, 332, and 336 days, while Meigs had seen one of 420. Jaffe describes an instance of the prolongation of pregnancy for 365 days, in which, as in Hames's case, the weight and measurements of the child appeared to correspond to the degree of protraction. [The civil code of France limits the longest period of the legitimacy of an infant to 300 days, the Scottish law to 300 days, and the Prussian law to 301 days. We may safely assume that the French law, in fixing the limit of gestation at 300 days, is well within the normal duration of pregnancy, and it is difficult to accept as authentic most of the recorded cases in which the gestation, reckoning from the last day of the last period, is said to have been prolonged much beyond this period of time. There can be little doubt that many of the older instances of very protracted gestation are to be explained by the retention of the fetus in cases of extrauterine gestation. A very interesting medicolegal point has been raised in some of these cases as to when the 300 days is to be counted from. Is it to be reckoned from the exact hour of the marriage? from the hour of the death of the father or the hour of the separation of parents? or is it to be counted by legal periods of 24 hours? In a case which came before it the Court of Angers decided that the duration of pregnancy should be reckoned from the moment of the death of the father. The Court of Cassation, however, upset this judgment and laid it down that the word "jour" signified a period of 24 hours, counting from midnight to midnight. In the particular case in question the father died on March 19, 1866, at 2 A. M., and, according to the Court of Cassation, the period of 300 days commenced at midnight on the same day. The widow was confined on January 13, 1867, at 8 A. M., and the three hundredth day, therefore, expired at midnight of the same day. Another interesting medicolegal question which might arise is whether it would be possible for a woman to delay her delivery until the expiration of the limit of 300 days. In a case of this kind in which the wife wished to give her husband grounds for bringing an action against her, the medical man is said by the administration of laudanum to have succeeded in delaying the birth of the child from the two hundred and ninety-eighth to the three hundred and first day.]

THE DIAGNOSIS OF PREGNANCY.

Early Signs of Pregnancy.—[The earlier a diagnosis of pregnancy and of the death of the fetus can be made the better.] O. Schaefer¹ says that careful observations will show in the newly pregnant woman a temporary pointedness of the features, swelling of the breasts, and an unexplained and obstinate tendency to faint, decrease in the urine, somnolence, forgetfulness, and a temporary decrease in mental acumen, if the patient is anemic. These are well-known early systemic signs.

¹ Centralbl. f. Gynäk., 1901, No. 50.

The new local signs to which he directs attention consist in a characteristic discoloration in stripes, reddish on a livid background, which appear in the neighborhood of the urethra or on the vestibule of the vagina. The stripes run for the most part crosswise or obliquely. So soon as the child within the womb is dead these stripes disappear, especially if the uterus is emptied, even though a packing of gauze be placed within it. The condition is due, therefore, not to the simple hindrance of the blood-flow, but to a vasomotor reaction depending entirely upon the life of the child; as soon as the pains begin with the purpose of emptying the uterus of the dead fetus, the stripes disappear. An examination of the blood will show what the writer terms resistance of the cells of the blood from the uterus to admixture with various physiologic, pathologic, and artificial substances. The most simple and direct method of making this examination is to employ the iodine-potassium-iodid solution of Gram. This mixture makes the so-called resistant blood-cells brown, the less resistant a light yellow, and the very feebly resistant almost colorless. As a rule, if the woman is healthy, the blood-cells which take a deep stain outnumber the weakest between $2\frac{1}{2}$ and 5 to 1. The method is not absolutely reliable, but is an indication strongly suggestive of pregnancy. Whenever the blood-examination is resorted to, it will be wise to make a control test of the blood taken from the finger, simply because the blood from the uterus alone may be misleading. Another feature of the blood in early pregnancy is that when the cervix is pricked to draw it down, it is rather difficult to stop the hemorrhage. More recently Schenk¹ has tested on 61 patients the value of the following 3 signs of commencing pregnancy: (1) The increase in the size of the uterus in the sagittal diameter; (2) Hegar's sign of the compressibility of the lower uterine segment; (3) the asymmetric shape of the uterus. One side of the uterus seems larger than the other, and the phenomenon is accompanied by a deep groove, outlining the enlarged projection, which is always softer than the other side. Schenk found that the increase in the sagittal diameter is a constant and most valuable sign in the very earliest stage of pregnancy, while the other two are of minor importance. At the third month Hegar's sign can be noted in almost every case, and the asymmetric shape of the uterus was observed in about 75 %. Dickinson considers that Hegar's is the most important of all the bimanual signs of early pregnancy. In regard to the purplish hue of the vagina produced by the venous congestion, Chadwick has shown that 80 % of pregnant women develop the color by the end of the third month, while a faint venous color may show itself by the end of the first month. Jewett claims that the more or less marked lividity of the vaginal portion of the cervix may be observed almost the first month after conception.

Pigmentation of the Abdomen.—Lehman² calls attention to the common error of supposing that the pigmentation in the median line of the abdomen is to be found only in pregnant women. He shows that it

¹ Prag. med. Woch., Jan., 1902.

² Rev. prat. d'Obstet. et de Pædiat., Sept., 1901.

may be observed in both sexes and at any age. Even in young children it may appear in connection with inflammation of the intestines, typhoid fever, and tuberculosis, while it is often marked in healthy girls at the time of puberty. The discoloration in the latter is probably due to the general congestion of the pelvic organs, and may be regarded as the forerunner of the first menstrual flow. If the menstruation is regular and normal, the dark line disappears; if irregular and painful, it is apt to persist. Among 122 young girls examined by the writer the line was present in 66. Of these, 26 suffered from amenorrhea, 20 from dysmenorrhea, and 14 from menorrhagia; 6 had obstinate constipation and abdominal pains. The other 56 patients menstruated regularly without pain, and had no intestinal disturbances. After the climacteric the line of pigmentation is barely visible.

THE HYGIENE OF PREGNANCY.

J. W. Ballantyne¹ wrote a most interesting sketch of "a visit to the wards of the Pre-Maternity Hospital, or a twentieth century forecast," in which he painted a vivid word-picture of the hospital of the future, where the practice of preventive medicine as applied to the mother and fetus *in utero* will be carried out—a hospital over the door of which will be inscribed the appropriate motto, "Teach us what we shall do unto the children that shall be born." The observations which Prochownick, of Hamburg, has published during the past year on the influence of diet upon the nutrition of the fetus are of much importance. He claims that by placing stout women who have had difficult and instrumental deliveries upon a special diet he has been able to procure for them an easy confinement and an ability to nurse their children. In the case of patients with a contracted pelvis and a conjugate varying from $3\frac{1}{2}$ to 4 inches he holds that he has established by his experience of 48 cases with 62 confinements that by special diet it is possible so to influence the average weight and development of the fetus as to enable it to be born at full term without difficulty in cases in which on previous occasions instrumental delivery or the induction of premature labor had been necessary. These observations of Prochownick have received interesting confirmation from the experiments of D. Noel Paton, who has found that in a well-fed guinea-pig each gram of body-weight of the mother produces 0.35 gram of young, while in a medium-fed animal the amount is 0.33 gram of weight of young, and in an under-fed animal only 0.22 gram of weight of young. Prochownick's diet consists in allowing the woman, during the last 3 months of her pregnancy, roasted and boiled meats, without sauces, fish, green vegetables, salads, cheese, butter if desired, and a very small quantity of bread. Water, soups, potatoes, the farinaceous foods, and beer are proscribed, and sugar is to be replaced by saccharin.

[Urine examination during gestation is very important, and must be thorough in order to appreciate impending disaster.] Marx,² in

¹ Lancet, Dec. 28, 1901.

² Amer. Med., June 8, 1901.

reviewing the toxemias of pregnancy, has urged the importance of urea estimation in the investigation. The old time-honored examination for sugar and albumin is not sufficient, for in many desperate and malignant cases of toxemia during pregnancy there is found neither albumin nor tube-casts, while the urea is always found markedly diminished in the so-called toxemias or urinemias of pregnancy. Upon this progressive diminution of urea-secretion, with or without albuminuria, will depend the indications for the induction of premature labor.

PATHOLOGY OF THE FETUS AND OF THE FETAL APPENDAGES.

Intrauterine Death.—J. Oliver¹ calls attention to intrauterine death resulting from superatrophy of the chorionic villi. He remarks that the allantois, which is a very vascular structure, appears about 14 days after the ovum is fertilized. It grows rapidly, and toward the end of the third week of gestation the vessels of this structure have penetrated all the villi of the chorion. At this period, therefore, the ovum may be considered as universally placental, and by imbibition all the villi aid in nourishing the ovum. Toward the sixth week of pregnancy, however, that portion of the uterine mucosa which is destined to participate in the formation of the true placenta—the so-called decidua serotina—begins to be differentiated, and simultaneously the chorionic villi correlated to this serotinal area become more and more enlarged, while the nonplacental villi gradually undergo atrophy. The atrophic changes taking place in the chorionic villi may affect not only the nonplacental but the placental villi. Atrophy of the nonplacental villi is a natural phenomenon, but occasionally the process extends to and involves more or less extensively the placental villi as well. A parallel condition of affairs is sometimes noted in the case of the uterus after parturition when the dissolutionary changes transcend the normal amount and produce a state of superinvolution. The decidua serotina and the placental villi react mutually on each other, consequently the atrophic process extending to the placental villi causes the serotina to cease developing, and sooner or later these two conditions will suffice to bring about the death of the ovum. Because of the insidious progress of this abnormal phenomenon the ovum may be retained for several months after its death.

Malignant Deciduoma.—[Before 1888, deciduoma malignum was not recognized as a definite pathologic entity, though it was a known fact, and had been commented upon by several observers, that, after normal delivery, abortion, and particularly vesicular mole, a few patients died of a rapidly fatal disease which showed at autopsy sarcoma-like masses in the uterus, and often extensive deposits in various parts of the body. In the year just mentioned Säger described several cases, recognized the disease as being different from ordinary sarcoma, and named it deciduoma malignum, by which term it is most often known at present. In 1893 he published a further contribution to the sub-

¹ Brit. Med. Jour., Feb. 15, 1902.

ject, and changed his designation to sarcoma deciduo-cellulare, thinking that this more accurately described the histologic structure of the growth. Since Sanger's contributions there have been others; but beyond giving us an accurate clinical picture of the disease, and settling some facts as to its frequency and occurrence, not much has been done. The exact nature of the growth is still a subject of controversy. However, certain facts in this connection have been brought to light, and though not accepted by all, they probably rest on a sound basis. It is practically certain that the neoplasm is of fetal origin, and that the maternal tissues are only involved by contiguity. That peculiar mass of tissue called the syncytium is apparently the starting-point of the disease, and on this account the growth has sometimes been called syncytioma malignum. When this syncytium begins to grow in an atypical manner, it shows a decided tendency to open blood-vessels and to disseminate itself by these channels, in this regard resembling strongly certain characteristic forms of sarcoma, though we are not therefore necessarily justified in classifying the growth as sarcoma. The syncytium has another peculiarity, consisting in the fact that ordinarily it is not divided into cells, though large nuclei can be seen in it. In some instances, however, distinct division into cells can be made out. It may be said that up to the present the most accurate classification calls deciduoma malignum an epithelial neoplasm of epiblastic origin, and that it is apparently closely related, certainly in its clinical behavior, to the angiosarcomas or endotheliomas. A fair general idea of the character of this growth may be had by remembering that deciduoma malignum bears the same relation to normal placenta as is borne by carcinoma of the breast to normal mammary gland—that is, each of the pathologic forms represents the atypical development of a tissue which should pursue a normal course of growth. To make a diagnosis of this fortunately rare disease is not difficult. The symptoms usually appear within a few weeks of the delivery, abortion, or vesicular mole, and an antecedent history of the last is so frequent in these cases that every instance of it should be observed until danger is passed. The chief symptom is persistent hemorrhage, and when it appears no time should be lost in having some of the scrapings from the interior of the uterus examined by the pathologist, so that if necessary prompt treatment may be undertaken. The course of the disease when not interfered with is one of extreme malignancy, and usually lasts only 2 or 3 months, when the patient dies from exhaustion and metastases. Up to the present, no treatment holds out the least prospect of permanent benefit; but immediate hysterectomy, done by whatever method, insures the complete removal of the local disease. After the disease has once extended beyond the uterine cavity, no treatment is of the least avail. That even in the presence of this very malignant condition we are not helpless if we act promptly may be gathered from some statistics collected by R. Williams. Out of 14 cases operated on by hysterectomy, 12 survived the immediate operation, and of these, 5 were known to have died within a year. Of the remainder, 6 were known

to be living at periods of from 3 to 10 months, and also to be free from recurrence. This showing is not so bad when the extreme malignancy of the disease is remembered, and future improvement may be looked for in the direction of early diagnosis, and consequent promptness of treatment. The disease is happily rare; but cases appear from time to time, and when they do, they should be studied carefully, especially in their pathology and histology.] Ladinski¹ thinks the name deciduoma malignum is the most appropriate. Clinically, however, he says the disease presents a clear and distinct picture, and its diagnosis, which is most important, should not be difficult. Pregnancy is an absolute concomitant or precursory condition of deciduoma malignum, and the chief clinical features are: (1) History of recent parturition or abortion, especially if a hydatid mole has been discharged or a placenta retained; (2) profuse hemorrhage occurring at irregular intervals, without apparent cause, and not amenable to the ordinary means of treatment, and which recurs in spite of repeated curettages—the presence of a constant sanguineous discharge during the intervals of hemorrhage; (3) a persistently large and hyperplastic uterus and cervix, with a patulous os; (4) pain in the pelvis; (5) anemia, rapid loss of flesh and strength, and cachexia; (6) the characteristic nodule in interior of the uterus in the early stage. This growth begins as one or more minute, dark-colored or reddish nodules, and springs from the endometrium, either by a broad base or pedicle—it is soft, spongy, friable, and bleeds very profusely on touch; (7) the presence of metastatic deposits, especially in the vagina and lungs, the latter producing cough and bloody expectoration. It is the most fatal of all neoplasms, and, considering the rapid progress of the disease, the treatment should consist of complete extirpation of the uterus and vaginal metastasis, if present, as soon as the diagnosis is made from the clinical signs or histologic examination. Any measure short of this will only aggravate the condition. This should be resorted to, even in the suspected presence of metastatic deposits in other parts of the body, for in a few cases these secondary deposits disappeared after the primary tumor was removed. Ladinski describes a case in detail, and appends a collation of 132 authentic cases. According to Pierce,² among 78 cases recently collected by MacKenna the disease occurred 35 times after hydatid mole, 22 times after normal labor, and 12 times after abortion. As hydatid moles seem to be a predisposing cause, their structure has been carefully studied to determine why certain moles become malignant, and on this subject Butz draws these conclusions: (1) Malignancy does not lie in the inward proliferation of syncytial elements, as claimed by Neumann; (2) the peculiarity of the case described by him was in showing small villous processes and a scarcity of mole vesicles; (3) when the mole is only partly expelled spontaneously, the remainder being removed in pieces by the curet or finger, the liability to malignancy is greater than when the mole is expelled entire; (4) specimens from curetment of his case showed a proliferation of fetal cells into the depths of the mucosa no further than is observed after normal birth, but in

¹ Am. Jour. Obstet., April, 1902.

² Am. Jour. Obstet., Mar., 1902.

much larger quantity; (5) malignancy lies in disease of the uterus, not in the mole itself. The first symptom of the disease is usually hemorrhage, which may take place during the involution period or several weeks later, and is of a more or less spouting character, like blood from an open vessel. This is followed by discharges of a dirty watery nature, persisting between the hemorrhages. Metastases are frequent in the vagina or in the lungs. The disease is accompanied with fever. The uterus increases in size, is softer than normal and tender, the os is dilated and within is a soft friable mass resembling placental tissue attached by a broad base. It is mottled red and dark purple in color. Occasionally the tumor occurs in the vagina instead of in the uterus. The prognosis is bad. If taken early, recovery may follow, but in most cases the diagnosis is made after metastases have developed. For this reason comparatively little can be done, and the only hope lies in early diagnosis. Statistics by Eirmann show that it belongs to the most malignant of all forms of tumor, death occurring in most cases within 6 months, whether operated upon or not. There is only one method of treatment—total extirpation of the uterus as soon as the diagnosis is made. Most operations have been by the vaginal route, but, because of the danger of spreading the disease, Pierce favors the abdominal route, as thus much of the manipulation of the uterus can be avoided, at least until the vessels have been secured.

The Development of Monstrosities.—An editorial in the "Philadelphia Medical Journal," January 18, 1902, remarks that the occasional reports of interesting cases of fetal malformations that occur in the current literature arouse a more than passing interest as to the etiology of these peculiar miscalculations of nature. From the time of Geoffroy Saint-Hilaire, to whom are due the thanks of the medical profession for first scientifically grouping and classifying these teratisms, down to the present day, there have been attempts made to fathom the causation of the malformation. At one time they were almost unanimously attributed to the profound effect resulting upon the embryonic tissues from grave maternal impressions, usually of the nature of a fright, as from exposure of the pregnant women to some shocking sight or accident. A certain percentage of malformations may, and undoubtedly do, so result. It is probable, however, that this percentage is but a very small one, for a careful examination of the histories of these cases shows that generally the impression was made at a period too late in the course of the gestation to result in any profound alteration in the fetal structure. To be most effective such a cause must act in the earlier weeks of pregnancy, before the embryologic changes have occurred that result in the development of a normal fetus. Of the more recent writers upon this subject, the distinguished German embryologist and obstetrician, Landau, is most outspoken against the theory of maternal impressions. He emphatically remarks that "maternal impression is and remains a superstition, and despite Welsenburg's highly instructive work on the subject, it has not become worthy of scientific recognition." H. L. Lewis inclines to the belief that all teratologic

developments can be explained by purely physical and mechanical causes entirely remote from psychic influences. This view is supported by the interesting results produced in the laboratory in the artificial production of monstrosities. Scientific study in this direction has developed so far that to-day it is possible by thus interfering with the growth of the ovum to produce different varieties of teratisms at will. Here we have a total abolition of the mental influences and a purely physical and mechanical explanation for the resulting deformities. The same explanation must be advanced to account for the numerous instances of malformation encountered in chickens and other domestic animals, in whom it is reasonable to suppose psychic influences are at their minimum. It has been found that by disturbing hen's eggs or the eggs of serpents at different periods of incubation vastly different forms of teratism result, and that these forms were invariably reproduced if the agitation of the eggs in different experiments was accomplished on corresponding days. The later in the course of incubation the disturbance occurred, the milder the degree of teratism, and vice versa. In other words, all grades of malformation are merely arrests of development, and the earlier this arrest occurs, the graver the form of monstrosity. Thus, the rare condition of cyclops must of necessity be produced by some developmental arrest in the earliest days or weeks of embryonic existence before there has occurred a distinct differentiation of the optic tracts, while the various fissions, as exomphalos, harelip, and cleft palate, are of much later development. As to what the causes of the developmental arrest in the human family are, there is but little known. Profound shock in the first days of gestation, poverty and want producing fetal anemia, and consanguinity and incestuous connections have been suggested. Barnes, of England, especially emphasizes the importance of marriages of near relatives as an etiologic factor. A close study of the antecedents of each case of teratism as it results will be necessary to enable us to come to any sound conclusion as to the cause of such anomalies. Fetal pathology, while much better understood to-day than 25 years ago, is still a rich field for investigation and original research.

An editorial in the "British Medical Journal," March 15, 1902, states that the idea that the birth of monstrous human infants was the origin of the deformed deities of mythology is not new, but it is doubtful if the various aspects of the subject have by any means been fully considered. There is much to make us think that, so to say, the gods did not create men, but men made the gods, in the sense that in early times the occurrence of a monstrous birth suggested to the people of these early times that their gods, or at least their demi-gods, might have appearances similar to these seen in the deformed products of human reproduction. When, therefore, we call the one-eyed infant the cyclops *foetus*, after Polyphemus, the king of all the Cyclopes, we are really in error, and ought to say that Polyphemus owed his existence in the pantheon to the birth of a human (or animal) one-eyed fetus. So much seems fairly certain; but there are several speculations which

spring from this generalization, and to some of these Schatz has referred in a recent address.¹ There is the identification of the monstrosities which give rise to some of the demi-gods which do not show obvious resemblances to any teratologic products; there is the question why certain comparatively common monstrosities do not seem to have suggested any gods at all; and there is the consideration of how far the national character was potent in guiding the choice of the monstrosities to be made use of in constructing the national gods. Professor Schatz touches suggestively upon all these topics from the special standpoint of Greek mythology. His identification of the Siren with the sympodial fetus, of the Centaur with the infant born with two pairs of lower limbs, of the Gorgon head with an acornic placental parasite, of Atlas with the child carrying an occipital encephalocele, and of Janus with the double-faced but single-bodied monstrosity (*foetus janiceps*) seems exceedingly probable; but whether the Harpy owes its origin to the occurrence of a phocomelous fetus, and whether the birth of Athene from the brain of Zeus was foreshadowed by the birth of infants united by the crania, is much less evident. It may have been that the incident of the vulture tearing at the liver of Prometheus was suggested by the appearance of a fetus with *exomphalos*, and that the story of the peasants changed into frogs by Latona arose out of the birth of an *anencephalic* infant with *spina bifida*; but the evidence is far from conclusive. It is a striking fact that the Greeks in their deity-construction seem to have made no use of such wonder-exciting monstrosities as the *acephalic* parasites and the various types of united twins—for example, the *thoracopagous* and *dicephalic* monstrosities. In attempting to explain the lack of representatives of these teratologic types in the Greek pantheon Schatz lays considerable stress upon the national taste which led to the selection of monstrosities which were not in themselves ugly or inartistic. He points out that in the case of the *Cyclops* *foetus* there are two types, an ugly one and one which in comparison might be termed pretty; the Greeks took the pretty (!) one for the construction of the god *Polyphemus*; further, the nose, which in the monstrous infant lies above the single eye, was put in its proper (esthetic) position under the eye. It would be a most interesting line of investigation to apply this principle of selection to the mythologies of other nations, and more especially to those of the East, and to the gods worshiped by primitive peoples. The results might be of unexpected service in clearing up moot points in comparative mythology and racial folklore. At any rate, if some even of these speculations turn out to be true, it may be said, in a somewhat novel sense, *Saepe visæ formæ Deorum*.

[Of all forms of monstrosity the *xiphopagous* variety seems to excite the most interest at present, thanks to the operations recently performed by Doyen and Chapot-Prévost.] An editorial in the "British Medical Journal," February 22, 1902, discusses the subject fully as follows: Great prominence, more indeed than accords with our notions of pro-

¹ "Die griechischen Götter und die menschlichen Missgeburten," Wiesbaden, 1901.

fessional reticence, has been given to Doyen's operation for the separation of the xiphopagous twins Radica and Doodica. The profession may, however, as well bear in mind that the public always take an interest in monsters, and the idea of the separation of conjoined twins is a theme which many who dwell on certain metaphysical questions about the precise limits of individual entity like to take into consideration. Doyen states, in a signed article in the "Echo de Paris" for February 10th, that "it had been already diagnosed that Doodica was the subject of tuberculous peritonitis," the lungs were slightly affected in both sisters and Radica had suppurating strumous cicatrices on her neck. He hoped to save at least one twin, and believed that, as often happens, the other, who had tuberculous peritonitis, might be benefited or even cured by the opening and "toilet" of the peritoneum. The teratology of these twins must be fairly familiar. Conjoined twins, and an "autosite" with a parasitic fetus more or less imperfect, alike develop from one ovum, and being uni-oval are invariably unisexual. Of the autosite and parasite twin we have written some 14 years ago, when the case of Laloo was reported in the "British Medical Journal" (vol. 1, 1888, p. 436). In that article we referred to other autosites who went about with relics of twin brothers hanging from them; a complete scientific report of Laloo, by Bland-Sutton and Shattock, is to be found in the "Transactions of the Pathological Society" for 1888, vol. XXXIX, p. 427. Closely allied is the "acardiac" monster, in which the arrested development of its body is due to interference with its circulation, the allantois of the other twin growing faster than its own, so as to occupy the greater part or the whole of the decidua serotina; the allantois of the monster is then inserted on that of the autosite, the vessels inosculate, but the monster's circulation is reversed by the more developed heart of the perfect twin. Hence the heart of the monster atrophies, and its development is grotesquely affected, edema adding to the disfigurement due to an absent head or limb. Uni-oval twins may, on the other hand, develop separately without prejudice to each other. Between this condition and the autosite with a parasitic twin come the true double monsters, of which Radica-Doodica are examples. The fusion and separation of the upper and lower parts of the body are found in almost every degree and relation, but it is only when the separation is far in excess of the fusion that the twins survive their birth. The fusion may be posterior (opisthozygosis), as in the case of Millie-Christine, the "Two-Headed Nightingale," twin mulattos exhibited 30 years ago in London, so that the twins are attached back-to-back. When fusion is anterior (emprothozygosis), we get the condition seen in Doyen's case. The class includes a not very rare kind—thoracopagus, in which the twins are united by their thoracic cavities, the viscera blending fantastically, so that, for instance, there may be fusion of the hearts. Life cannot be maintained in such a condition after the suppression of the placental circulation at birth. The allied variety, xiphopagus, is distinguished by simple union of the ensiform or xiphoid cartilages of the sternums and of the abdomen above the umbilicus. The livers seem always united

by a narrow band of hepatic tissue. The malformations in xiphopagus are not always sufficient to prevent the twins from surviving their birth. Radica-Doodica and the Siamese twins come under this variety of monster. The famous Chang and Eng Bunker were born in 1811, near Bangkok, Siam. They were brought to Europe when children, and then crossed the Atlantic, and having made money by their interesting monsterhood, each purchased a farm in North Carolina, the twins residing about 3 days at a time at each farm. They were very prosperous and universally respected. Chang was 5 feet 2½ inches in height, Eng just 1 inch higher. They married sisters in 1843, Chang had 10 children, Eng 12. One boy and one girl of Chang's were deaf and dumb, but there was no other blemish of any kind in the family of the twins. They lost all their property in the Civil War, and bravely set to work exhibiting themselves in Europe. In 1869 Chang, naturally emotional, became intemperate. The fact that his brother remained sober of habit is of high psychologic interest. In 1872 Chang had an attack of right hemiplegia, and could never walk up or down stairs easily afterward. In January, 1874, Chang was seized with bronchitis, which was neglected. On the morning of January 17th Eng called to one of his sons to come and waken Chang. The youth cried out, "Uncle Chang is dead"; and poor Eng replied, "Then I am going." Dysuria and dyspnea set in, and he died 2 hours after his brother; they were 63 years of age. An admirable report was drawn up by Professor Harrison Allen, and may be found in the first volume of the "Transactions of the College of Physicians of Philadelphia." The band was very short, broadest above, and measured 9 inches in circumference. It contained the ensiform cartilages, which were united by a symphysis, a true joint with a synovial sac and ligaments. There were also two peritoneal pouches on each side, without any communication between the fraternal peritoneal cavities. A delicate prolongation of liver substance ran from the anterior border of the left lobe of each liver, to be lost in the connecting band. A vessel ran in the band between the two livers. Boehm, in 1866, operated on a case of xiphopagous twins, his own daughters, a few days after their birth: one died; the band was narrow. The operation on Marie-Adèle in 1882 failed, the twins dying of hemorrhage. Chapot-Prévost operated on Rosalina-Maria, the Brazilian twins, in May, 1900. The cavities of the pleura, pericardium, and peritoneum communicated with the corresponding serous cavity in the opposite twin. Rosalina was saved. Chapot-Prévost closed the abdominal wall with great care. That part of the operation on Maria was done by assistants; she died on the sixth day. Radica-Doodica are familiar to readers of Bland-Sutton's "Tumors, Innocent and Malignant." Doyen operated on February 10th for reasons mentioned above. The operation was done in 20 minutes. The skin was divided in front, the conjoined ensiform cartilages easily separated with a bistoury, the peritoneal cavity opened, and a thin bridge of hepatic tissue exposed. Doodica showed, as expected, the signs of tuberculous peritonitis. The hepatic bridge was compressed with a double-lever forceps which exercised a

PLATE 5.



The Kiukiang twins (Holcomb, in N. Y. Med. Jour., July 27, 1901).

pressure of 2000 kilograms. Two interlocking catgut ligatures were applied on Radica's side, then the bridge was cut beyond the ligatures toward Doodica; 3 large arteries also required tying. Then two interlocking ligatures were applied to the bridge on Doodica's side; on dividing the posterior part of the peritoneal channel and the skin forming the posterior aspect of the band, the twins were separated entirely. The edges of the wound in Doodica were held together with forceps. Then the wound in Radica was closed with sutures, but a small strand of gauze was left in for drainage. The "toilet" of the peritoneum, in this case affected with tubercle, was carefully done when Doodica was attended to, and then the wound was closed and drained as in the sister. As the integuments of the band retracted no trace of it remained on either side except a linear suture. On the morning of the operation Doodica took a small quantity of methylene-blue; two hours later urine from both the twins was examined, and Radica's was as deeply colored as that of Doodica, who alone had taken the reagent. On the night of the operation and for a time the separated twins did well, but 6 days later Doodica died suddenly after a slight convulsion, from the rupture, as was proved at the necropsy, of a tuberculous abscess into the abdominal cavity. Radica, the surviving sister, continues to make good progress. The separation of Chang and Eng might have been more safely effected had aseptic surgery been in vogue in their days, as there was no communication between the peritoneal cavities as in Radica-Doodica, and they were hale and hearty little gentlemen. They did not wish to be separated, several eminent surgeons advised against it, and therein all parties acted very wisely.

The accompanying photograph of the Kiukiang twins (see Plate 5) described by Chapot-Prévost will be of interest in this connection. It is furnished by R. C. Holcomb.¹ Jewett² records an interesting case of epignathus and gives an historical account of this rare form of monstrosity. Lichem³ reports 2 cases of foetus papyraceus; Palmedo,⁴ a case of thoracopagus; Huet and Infroit,⁵ a case of ectromelian hemimelus; Ahrens,⁶ a case of fetal inclusion in the ascending mesocolon; and Dervaux,⁷ a case of total evisceration in a 4 months' fetus.

THE PATHOLOGY OF PREGNANCY.

The Pernicious Vomiting of Pregnancy.—[Persistent vomiting during pregnancy is not a morbid entity, but a mere exaggeration of the milder form which occurs so frequently. Three theories of causation are given, namely: (1) Nervous disorder; (2) reflex originating in the genital organs; (3) intoxication.] While the nervous theories cannot be wholly set aside, M. Hugué⁸ considers most cases of incorrigible vomit-

¹ N. Y. Med. Jour., July 27, 1901.

² N. Y. Med. Jour., Mar. 22, 1902.

³ Centralbl. f. Gynäk., Feb. 8, 1892, No. 6. ⁴ Münch. med. Woch., No. 5, 1901.

⁵ Gaz. hebd. de Méd. et de Chir., June 23, 1901.

⁶ Arch. f. klin. Chir., vol. LXIV, 1901, Part 2.

⁷ Jour. des Sci. Méd. de Lille, Aug. 10, 1901, No. 32.

⁸ La Presse Méd., Oct. 9, 1901.

ing to be due to intoxication. The cause is to be sought in disorders of the liver, kidneys, stomach, or intestines, superinduced by the excessive work imposed on these organs by pregnancy. Treatment may address itself to the nervous state of the patient, to the gastric condition, and to the systemic intoxication. Reflex nausea due to uterine lesions or displacements calls for treatment of these conditions. By careful dieting and appropriate medication gastric digestion must be promoted and cardiac erethism controlled. The urine always demands close study; albuminuria or diminished urea suggests a milk regimen; antisepsis of the alimentary tract is an important indication. Rectal alimentation may obviate in part errors of digestion and absorption incident to feeding by mouth. Evacuation of the uterus is a last resort. Taylor¹ remarks that the chief causes of this complication are: (1) Deficient excretion due to carelessness in regard to personal habits; (2) certain mechanical reasons, as the pressure made upon the rectum, ureters, and bladder by malpositions of the uterus, or by various tumors with or without adhesion due to previous pelvic diseases; (3) nervous irritability. Under this heading he includes vomiting due to irritation of the vomiting center in the medulla oblongata, either by some lesion of the nervous system, a brain tumor, cerebral abscess, the effects of toxins carried to the medulla by the blood, as in malaria, or by reflex irritation from some portion of the body which is organically connected with the medulla, and generally with some portion of the pneumogastric. The so-called pernicious form of vomiting, he claims, is simply an intensification of the conditions above described, due usually to prolonged neglect or ignorance. Unfortunately there are too many women anxious to avoid pregnancy who will try by every means at their command to induce some physician to resort to the operation of dilation of the cervix or emptying of the uterus by exaggerating the amount of their nausea and vomiting. Cristeanu² accounts for incoercible vomiting by the awakening in gestation of an arthritic or herpetic diathesis in which there is incomplete combustion and retarded elimination with the accumulation of toxic substances in the organism. An effort at elimination by the gastric and buccal mucosa leads to irritation, producing nausea, vomiting, and sialorrhea. In one case traces of urea were found in the saliva. Baths, lithium carbonate, vichy, belladonna, and antiemetics are recommended.

Trible³ recommends sodium bromid in the vomiting of pregnancy due to reflex nervous irritation. He cites the case of a woman, 6 months pregnant, who was unable for nearly a week to retain any food. Various drugs had been tried, with no apparent benefit. The position of the uterus and the condition of the os were normal. Rectal injections of 40 grains of sodium bromid, dissolved in a sufficient quantity of water, were given every 3 hours until the vomiting ceased. The following morning the patient ate and retained a good breakfast of milk and eggs. By the continued use of the bromid in smaller doses,

¹ Ann. of Gyn. and Pediat., May, 1901. ² Med. Press. and Circ., Sept. 18, 1901.

³ Merck's Archives, May, 1901.

the vomiting was avoided, and finally ceased altogether. Several similar cases of vomiting of pregnancy occurring in Tribble's practice have all yielded rapidly to this treatment. Condamin,¹ of Lyons, reports favorably on the use of rectal injections of artificial serum in obstinate vomiting of pregnancy, obviating in some instances the induction of abortion. The injections must be continued for several days, and all feeding by mouth stopped. The amount of serum daily injected is from 5 to 7 pints, in half-pint quantities at a time. The injection is made slowly, occupying about 15 minutes each time. In cases of intolerance the addition of a few drops of laudanum generally overcomes the difficulty. It is necessary to continue the injections for about 10 days, after which time the patient may commence to take a few mouthfuls of liquid food, and then gradually return to the ordinary way of feeding.

The Favorable Influence of Pregnancy upon Enteroptosis.—Maillart² has for several years interested himself in observing the effect of pregnancy upon the large class of patients with enteroptosis and gastropnoxis at the Canon Hospital in Geneva, and has come to the conclusion that patients emaciated and debilitated by this disease recover a remarkable degree of health on becoming pregnant. Far from completing the destruction of an already shattered constitution, he found that pregnancy arrested the disease and often produced a complete disappearance of the symptoms. The conclusions at which he arrives are the following: (1) In cases of enteroptosis the advent of pregnancy increases the intraabdominal pressure as soon as the uterus has attained a certain size. (2) Under these circumstances pregnancy produces an improvement in the digestive and general nervous system, which reveals itself by an increase of from 2½ to 6 kilograms in the body-weight between the time of impregnation and the close of the puerperal period. (3) As a result of judicious treatment this improvement, which often approaches in character a complete recovery, may be made more or less permanent, so that in the months which follow the pregnancy a further increase in weight may result. (4) In the cases in which other causes, such as renal disease, the neglect of proper treatment, etc., prevent this improvement from taking place, pregnancy produces in general no actual ill effects upon patients with enteroptosis—surely not in the cases which suffer from constitutional neurasthenia. The measures taken to secure the permanence of the temporary improvement which takes place during pregnancy must be begun during the pregnancy, and continued during and after the lying-in period. All the cases which Maillart treated were provided with a suitable abdominal support before pregnancy, which was continued during the first 4 months, and then replaced by others of sizes suited to the gradual enlargement of the abdomen. The clothing was so arranged as to depend entirely from the shoulders, and produce no pressure upon the waist or hips. After the child is born a Glénard bandage is applied at once over the ordinary bandage, in order to maintain the intraabdominal pressure, and enable the patient to turn freely in bed without the falling of the

¹ La Sém. méd., Jan. 15, 1902.

² Centralbl. f. Gynäk., No. 50, 1901.

entire abdominal wall and contents to one side. The period of rest in bed is made as long as possible, and should be naturally longer in cases of enteroptosis than in ordinary cases. After leaving the bed the same support is worn as before the pregnancy. Under these measures the abdomen almost completely recovers its former firmness and size, and the organs are maintained in their former positions and under suitable pressure. The proper training of the child as to regular times of feeding—waking not more than once in the night, etc.—is even more important for the good recovery of the mother in these cases than in others, and the nursing and care of the baby have a favorable influence upon the mother by directing her attention from the selfish consideration of her own symptoms to the care and upbringing of her baby.

Valvular Cardiac Diseases in Pregnancy.—[The mortality among women with cardiac disease who have become pregnant varies from 20 % to 55 %. The condition, therefore, is one of the most grave and fatal of all those which confront the obstetrician.] Webster¹ has considered it in all of its phases, but with special reference to the therapeutic indications. There are a number of factors, each of which must be individually appreciated, which serve to invalidate the heart in pregnancy. The enormous increase in the vascular area and in the total quantity of blood imposes an additional mechanical strain on that organ. The deterioration in the blood, anemia, etc., lead to malnutrition of its musculature and to a certain degree of paresis. The distention of the abdomen limits the oxygenating power of the lungs, impedes their auxiliary action in circulation, and blocks the pulmonary circulation. All cardiac cases, therefore, suffer to a greater or less degree during pregnancy. If hypertrophy of the heart be sufficient, the disturbances are slight, manifesting themselves only as palpitation, cough, dyspnea, and slight edema. In the cases which fail to compensate properly, the most serious symptoms may supervene. The woman may then succumb to heart disease during pregnancy, or abortion may occur. If the case goes on to labor, this may also prove fatal to the woman. The treatment of all cases of heart disease should be prophylactic in the early stages. If abortion threatens, or if signs of beginning cardiac insufficiency appear, but especially if these two conditions occur together, the physician should always be ready to end the pregnancy in the interest of the mother. The labor, whether premature or at full term, demands the most careful management. If the patient stand it well, she may be permitted to go through the first stage without interference. If signs of heart failure appear, she is to be chloroformed (etherized), and the cervix dilated with Barnes bags or manually. The second stage presents similar indications. The woman is to be assisted, if necessary, by the forceps. The best stimulant during this stage is nitrate of amyl, or nitroglycerin, which neutralizes the increasing strain on the heart, due to the additional blood thrown out of the retracting uterus, by diverting it into the dilated abdominal vessels. The third stage is that to be most feared. Strangely enough, there is one

¹ Medicine, Feb., 1902.

set of observers which attribute the danger to anemia of the heart, while others hold that the patient dies from overdilatation. The author belongs to the latter group: "The whole vascular area of the body has been greatly reduced by the contraction of the uterus, the extra strain on the right side of the heart may be too much for it"; overdilatation and paralysis supervene. The indication is plain. The third stage is to be prolonged, at the cost of considerable loss of blood, in order to give the cardiovascular mechanism a chance to adapt itself to the altered conditions. The placenta is gradually separated by the fingers, and uterine contraction should be stimulated only if the loss of blood becomes serious. During the puerperium the treatment is limited to careful nursing and symptomatic treatment.

Pregnancy and Tuberculosis.—[By many authorities pregnancy is believed to exercise an unfavorable influence upon the course of tuberculosis; hence the question of its interruption by artificial means has arisen, the measure finding a certain number of advocates in France, Germany, and Italy.] G. Zanoni¹ maintains that, in general, abortion should not be induced after the third month, exceptionally in the fourth. During and after the fifth month the usual indications in the nontuberculous should be observed, pulmonary tuberculosis alone not justifying so grave a procedure in the later months. Tuberculous cases of more recent origin, of from 4 to 6 months' duration, are regarded as most promising; rapid, toxic cases, with anemia, anorexia, and adynamia, urgently demand the operation and benefit from it. Evidence of pyogenic invasion and tuberculous cachexia antedating pregnancy are contraindications to the measure. In those for whom the operation is contemplated the pulse should not exceed 100, taken in the morning while the patient is in the horizontal position after 5 minutes' complete rest without coughing, and the temperature should not be, during a period of 3 or 4 days' observation, higher than 99° or 99.3° F. Kaminer² gives a table of 50 cases showing the influence of labor and pregnancy on pulmonary tuberculosis. He does not believe that pregnancy should be terminated to prevent the subsequent existence of a person who would probably become tuberculous. He refers to 15 cases under his observation in which labor was artificially interrupted, and 2 cases in which it occurred spontaneously. In 12 % of these cases death occurred, in 30 % there was a marked increase in the severity of the disease, and in 70 % there was no change noticeable. In no case was there any suggestion of a real cure. This is strongly against Maragliano's belief that pregnancy should be artificially interrupted for the benefit of the patient. Kaminer believes that it does not aid the patient; that it is much more likely to make the patient's condition worse; and, at any rate, any little aid given by this method is only through the loss of the child. In many instances he believes that one is justified in interrupting the pregnancy, but that this is practically never one's definite duty, and, at any rate, a decision cannot be reached by following

¹ *Gaz. degli Osped.*, Mar. 2, 1902.

² *Deut. med. Woch.*, Aug. 29, 1901.

a general law, but only by observing each case. The most important point is to prevent conception in phthisical subjects.

Pregnancy and Smallpox.—An editorial in the "Philadelphia Medical Journal," September 7, 1901, remarks that the recent observations of Roger constitute a valuable addition to our knowledge of the placental transmission of disease to the fetus. It is now generally admitted that there are certain maternal diseases which affect the embryo and fetus, resulting either in the death of the latter or in the clinical manifestations of the disease immediately or shortly after the birth of the child. Antenatal and congenital syphilis is the most striking instance of the kind. For quite a long period the transmission of tuberculosis in this manner was denied, but recent careful investigators, Lehmann, Neil, Kynoch, Charrin, and others, have definitely settled the possibility of tuberculous infection of the fetus. Roger now gives an interesting review of a series of cases in 11 pregnant women observed by him in his smallpox service of Aubervilliers, all of whom gave birth to children who appeared to be absolutely well, but who all presented marked subnormal temperature, in one instance 28° C., in another 30° C., and in another 31° C. Of the children, 7 shortly developed marked manifestations of smallpox, the symptoms appearing in a typical manner, beginning with an elevation of temperature, followed by the characteristic cutaneous eruption; 3 of the remaining 4 showed intense infection, the only symptoms being jaundice and subnormal temperature, with death 4, 6, and 11 days subsequent to birth. One child developed a scarlatiniform eruption, and only one of the 11 survived, the others dying in from 2 to 3 days after the development of the eruption. A more interesting and instructive series of observations could not be reported. From the accumulated literature on the subject of transmissions of disease through the placenta from the mother to the child, it is evident that, next to syphilis, the exanthems are most prone to affect the fetus *in utero*. It is also interesting to note that the association of the disease with the pregnant condition reacts unfavorably upon the mother. Maternal death is not infrequent under these circumstances, and in every instance in which a fatal termination does not supervene the mother passes through a most critical illness. The mode of entrance of the morbid agent into the fetoplacental circulation is as yet a disputed question. It is probable, however, that access is gained through bacterial action, the germs rendering the placental villi less resistant to invasion, whereby both the microbes and their toxins pass the natural barrier at the choriodecidual junction. A curious fact which has been repeatedly proved on the autopsy table is that, as a rule, the infectious diseases do not manifest their characteristic visceral lesions in the fetus, probably because of the passivity of these organs during antenatal existence. The germs, however, may be detected in large numbers by bacteriologic and microscopic examination. Such reports as that given by Roger cannot be too highly commended. Inasmuch as they add to the meager literature of what is evidently a most important but as yet imperfectly understood chapter of medicine.

It may be stated in general terms that the occurrence of any of the acute infectious diseases during pregnancy renders the prognosis unfavorable. Should the fever be high and long continued, the pregnancy is extremely likely to be interrupted, and this accident is the cause of the frequent unfavorable course of the case. It was formerly believed that the pregnant woman was immune to certain of the acute infections; modern exact observation has proved the fallacy of this view. It is, however, true that pregnancy frequently accentuates a previously existing morbid condition, and more often, perhaps, the affection is deleterious to the pregnancy. The acute infectious diseases are especially dangerous during the puerperal period, as they are liable to produce an inflammation of the endometrium, which, as a rule, is associated with a metrorrhagia. Slavjansky¹ describes this condition in the case of Asiatic cholera. An abortion frequently happens, due to the continued high fever, death of the fetus, and the previously mentioned endometritis hæmorrhagica. It appears as if the pregnant woman were more especially susceptible to variola. Nevertheless it is true that variola is an extremely dangerous complication. "The liability to abortion increases directly with the age of the fetus and the severity of the attack of smallpox" (MacCombie). Should the patient live long enough in the hemorrhagic and confluent cases, abortion invariably occurs. Great hemorrhage is the rule, and sometimes the placenta is retained and must be detached. As regards scarlet fever, but few observations are at hand, due to the comparative rarity with which adults are attacked by this disease. In the cases, however, in which this complication has occurred, it has proved extremely dangerous. In case of the occurrence of measles during the puerperal period, the main danger lies in the liability to contract pneumonia, which is always an extremely serious complication, even when the measles is not associated with pregnancy. Erysipelas and diphtheria are exceedingly dangerous to the pregnant woman. Enteric fever in more than half the cases produces an abortion. Croupous pneumonia is comparatively rare, and when it occurs as a primary affection during the puerperium, it usually runs a favorable course. Malarial diseases are serious complications of pregnancy. Since Manzoni and Charcelay, in 1841, proved the existence of fetal typhoid fever, many other investigators have demonstrated its existence, including such eminent observers as Straus, Chambrelent, Widal, Eberth, and Fränkel. The Widal test has been demonstrated also in a number of instances, the blood being taken from various fetal organs. The result of the transmission of typhoid fever from the mother to the embryo or fetus is usually attended with disastrous results for the latter. The statistics of Sacquin and Martinet give a fetal mortality of 63.25 %. In other cases the fetus may survive, although manifesting the symptoms of the disease; while yet again it may be born alive and healthy during the course of the maternal disease. In brief, it should be stated that the earlier the pregnancy, the graver the results for both mother and fetus. In addi-

¹ Arch. f. Geburtsh., iv, page 285.

tion, women aborting during the course of typhoid fever, especially in the later stages of the disease, are more apt to succumb to the exhaustion incident upon the abortion, and, as has also been proved by various observers, their liability to septic infection is greater.

Diabetes and Pregnancy.—[Perhaps the most common, and at the same time the least disquieting, abnormality of the urine during gestation is glycosuria, or, rather, lactosuria, resulting from an absorption of milk-sugar from the functioning breast. On the other hand, the coincidence of true diabetes and pregnancy is an event of extreme gravity, which demands immediate recognition and stringent treatment.] The rarity of this latter condition, its importance from a diagnostic standpoint, and the difficulties in its treatment, all make the recent paper of Ernst's¹ a contribution of great interest. Diabetes is commonest between the ages of 40 and 60, a period of life which is well without the limits of the child-bearing period; indeed, two-thirds of the cases do not begin until after the menopause. When the disease does occur in a woman of child-bearing age, it usually suppresses menstruation, and may even produce atrophy of the uterus. There is, however, a small percentage of these cases in which menstruation continues; such patients may become pregnant, and even repeatedly pregnant, during the course of the disease. It is a well-known fact, however, that the severity of diabetes is very much greater in young subjects than in old, hence those diabetic women who are still capable of becoming pregnant usually exhibit a dangerous form of the disease. The pregnancy supervening upon this condition tends, as do all other forms of severe physical strain, to aggravate it and to hasten its progress. There is another possibility through which pregnancy and diabetes may become associated—namely, that a pregnant woman may become diabetic. In such cases the prognosis is much more favorable. The condition begins to improve within a few days or weeks after delivery, although the disease may recur in subsequent pregnancies. The diabetes may persist in mild form in the intervals between pregnancies, and may disappear after the menopause, or it may become progressively worse and take on a grave aspect. The effects of the diabetes upon pregnancy and childbirth are extremely deleterious. Intrauterine death of the child, with its variable train of results, has occurred in about two-thirds of the cases. Hydramnios is a frequent complication. As regards the woman, the lying-in may proceed normally, whether the diabetes improve or not. On the other hand, death may supervene in the same manner as after operations or injuries in such cases, with the symptoms of coma and collapse. The obstetric management of diabetes with pregnancy is evidently a very difficult problem. The author believes that the termination of the pregnancy—and that, too, at the earliest possible date—is the only course which can logically be followed. In the first place, the chances are two to one that the child will die *in utero*, hence its life is not of great account. But it is unwise passively to await this event, since the prolongation of the pregnancy

¹ Edinb. Med. Jour., Feb., 1902.

materially weakens the chances of the mother. The liability to death from collapse after delivery is in direct ratio to the age of the fetus. For these reasons the procedure advocated by the author seems wise and conservative.

Albuminuria in Pregnancy.—[Until within the past decade, when a contrary opinion arose, the presence of albumin in the urine was regarded, out of other symptoms, as the one sure and infallible sign of kidney lesion, the plain meaning of which was unmistakable. The pregnant woman in whose urine albumin was found was looked upon as in a very grave condition.] But according to Morse,¹ we now know that the presence of albumin in the urine does not necessarily indicate disease. It may be present in health. Its gravity and significance must be determined by the presence or absence of certain other symptoms, as 500 women out of 10,000 have albuminuria during pregnancy, yet of these 500 only 60 develop eclampsia; on the other hand, Gerster has collected a series of 108 cases, all eclamptic, in which, after repeated and careful examinations, no albumin was found at any time. But such examinations have shown that there exists a close relationship between the amount of urea eliminated and the development of toxic poisoning. Urea is a waste product, poisonous in itself, eliminated through the medium of the kidneys, and in health none of it is retained. A healthy individual eliminates 35 grams of urea in a day. Whenever a decrease in this amount continues for any length of time in pregnancy, signs of disturbances are not wanting. Marx says urea is always found markedly diminished in the so-called toxemias of pregnancy; and when symptoms of toxemia occur, they are caused, not by the albumin, but by faulty urea excretion. Morse concludes that the weight of evidence seems to be against the reliability of albumin as a symptom of serious import, and careful urinary analyses show a definite relation between urea and the development of toxic symptoms. A. Barone² discusses this question under the following heads: (1) Does normal pregnancy cause a superproduction of toxins or special toxins? and (2) What is the condition of the defensive organs in pregnancy? He maintains that during gestation there is stagnation of alimentary substances, and that the liver, under the unusual conditions, does not functionate adequately, consequently putrefaction of alimentary albumins occurs, with an outpouring of their toxic products into the circulation. Pinard is quoted as stating that the absence of menstruation constitutes a retention of organic secretion which necessitates an absolute integrity of the other secretions and functions, the author holding that suppression of the menses plays an important part in the toxemia of pregnancy. The fourth potent cause of toxemia is considered to be the blood, its decreased oxygen-bearing power leading to incomplete combustion of decomposition products. Upon the liver and kidneys especially falls the burden of counteracting this hypertoxic condition, the rôle of the former being neutralization of toxic products, of the latter elimination of nonneutralized toxic substances; but too often their functions are impaired by the

¹ Am. Jour. Obstet., April, 1902.

² Arch. d. Ostet. e Gin., ix, No. 2, 1902.

noxious effect of the blood upon their parenchyma through decreased nutrition and through modifications in the endoabdominal circulation, a condition of hepatointoxication resulting, and giving rise to headache, somnolence, general pruritus, uncontrollable vomiting, etc., or evidence of kidney disease showing itself.

A recent Geneva thesis by J. Olivier¹ reports the results of the investigation of the eliminating power of pregnant women by means of methylene-blue or rosanlin. The elimination was found normal in many cases which presented the severest symptoms clinically. In other cases the elimination was notably defective, while the course of the pregnancy and puerperium was normal. In 5 cases of eclampsia the elimination was defective in all but one. In this patient the elimination was perfectly regular, but the symptoms were far more severe in this case, and it terminated fatally. Olivier concludes that renal or hepatic insufficiency is not inevitably necessary to the production of autointoxication. The pathogenesis in certain cases evidently includes an overproduction of toxins. The elimination of such excessive amounts is possible in spite of the integrity of the natural emunctories. Stewart² made a series of experiments upon rabbits and white mice, with the urine of pregnant women, to determine the degree of toxicity, and, if possible, the cause. He made careful comparisons with results obtained by foreign experimenters, and concludes that 75 % of the deaths were due to bacterial infection of the urine at some stage of the experiments.

Chorea Gravidarum.—Leon Launay³ refers to the recent views of the pathogenesis of chorea in pregnant women, the observations of Pierre Marie and Gilles de la Tourette having lately given support to the view that chorea gravidarum is a different malady from Sydenham's chorea. The same authors contended that chorea gravidarum is a complex of hysteric phenomena mingled with tics, and that its position as a nosologic entity is rendered doubtful; and, moreover, that its prognosis is different from the chorea of Sydenham. Joffroy has recently (1900) maintained that in pregnant women it is possible and necessary to distinguish between choreiform hysteria and true chorea. On the other hand, Raymond and Paul-Blocq hold that chorea gravidarum is not essentially different from Sydenham's chorea. After a description of the choreiform jerks, etc., Launay notes the frequency of echolalia and coprolalia in the chorea of pregnant women. Cases are cited at length, illustrating true chorea gravidarum (15 in all). It is important to recognize that there is a parallel between this disease and hysteria as regards the following symptoms—namely, rachialgia, ovarian hyperesthesia, globus, and laryngeal (functional) disturbances, and that both the chorea and the hysteria of pregnancy may occur together in subjects with exophthalmic goiter. He concludes: (1) that a considerable number of cases published in medical literature as examples of chorea gravidarum belong to hysteria; (2) that others are *maladies des tics*; (3) that others, again, are chronic chorea (Sydenham's

¹ Jour. Am. Med. Assoc., June 21, 1902.

² Am. Jour. Obstet., Oct., 1901.

³ Thèse de Paris, 1901.

chorea), lighted up or reexcited by pregnancy; but that, after excluding all these forms, there remain (4) true and incontestable cases of chorea gravidarum proper (such as those published by Potain, Brouardel, and Germain See), and that in essence it is identical with Sydenham's chorea, its peculiar features being due to its occurrence for the first time during pregnancy.

Gunshot Wounds of the Pregnant Uterus.—[Gunshot wounds of the pregnant uterus, although of somewhat rare occurrence, present a subject full of interest to the surgeon and obstetrician, involving, as they do, many intricate points of diagnosis and treatment, and requiring the most careful judgment on the part of the operator.] The subject is interestingly brought before us by G. Gellhorn.¹ He has collected 18 unclassified cases of gunshot wounds of the pregnant uterus. These cases show that the contents of the uterus greatly diminish the force of the bullet, so that complete perforation of the organ is not the rule. Symptoms of hemorrhage and shock usually set in after such an injury, but in Gellhorn's 18 cases there are 2 notable exceptions to this rule. In each of these cases the uterus expelled its contents and the child died shortly afterward, but the mother recovered. In neither of these cases did any serious symptoms present themselves prior to the emptying of the uterus. Hemorrhage from the wound in the abdominal wall varied greatly, in some cases being very slight, in others profuse, and in still others mixed with amniotic fluid. In many of the cases intestinal perforation complicated the uterine wound. In those cases which recovered from the immediate shock general peritonitis usually manifested itself. Labor pains, setting in a few hours after the infliction of the injury, were the rule. An exact diagnosis of the condition is oftentimes difficult. The absence of fetal heart-sounds after the injury is supposed by some to be indicative, but in a case reported by Pritchard the fetal heart-sounds continued to be heard, and yet when the abdomen was opened the uterus was found to be perforated and the intestine wounded in 6 places. In discussing the mortality, Gellhorn excludes one case in which death occurred from a cannon-ball injury. Of the remaining 17 cases, 5 died and 12 recovered. Six of the patients were not operated upon, and only one of these died. In 9 cases submitted to operation 3 died. This mortality corresponds very closely to that of other statistics. Gellhorn thinks, however, that it is misleading, since many cases of gunshot injuries of the pregnant uterus which terminate fatally are never reported. The effect of the injury upon the fetus was reported in 15 cases; in 11 of these death occurred. Gellhorn urges early operation in all cases, in which advice we feel sure all surgeons will concur. Gellhorn inclines to the view that in most instances a better result will be obtained by the Porro operation, although in a few cases in which the uterine wound is small it may be closed and an expectant plan of treatment carried out. [We are hardly prepared to agree with the writer in his suggestion of always removing the uterus in these injuries. In the early months of gesta-

¹ St. Louis Med. Rev., Nov. 2 and 9, 1901.

tion, and when the uterine wound is not extensive, we cannot but feel that the more conservative treatment of emptying the uterus and closing the wound is not only more likely to result in recovery, but is also the most rational form of treatment.]

Tumors Complicating Pregnancy.—Considerable attention has been given to this subject during the year. Pregnancy complicated with **cancer of the cervix** is unfortunately much more common than is generally supposed, says J. E. Gemmell.¹ Solowij estimated that it occurred once in two thousand labors; in most instances it is demonstrated in the earlier months of pregnancy and ends in abortion or is treated at once. In early cases it is the generally accepted view that the uterus and its contents should be removed as a whole with as little delay as possible by vaginal hysterectomy; this is quite feasible up to 4 or 4½ months, and has been performed at the sixth month. The author finds in looking over the literature that pregnancy and the puerperium favor the growth of the neoplasm, hence early operation is advised. This is more serious in the later months. Natural labor permits the introduction of other septic infections and the bruising of the tissues. After the uterus has been emptied, it must be removed as soon as possible, as involution and absorption favor the spread of carcinoma and the production of metastases (Olshausen). The best operative results have followed radical operation, by the vaginal route. Whatever the treatment, the results are unsatisfactory. The choice of the route depends upon the surgeon and the individual case. Abdominal hysterectomy, with removal of the os per vaginam, is preferable to panhysterectomy. The methods of operation are: (1) Cesarean section and hysterectomy by abdominal route (Freund); (2) cesarean section followed by supravaginal hysterectomy, suture of the abdominal parietes, and extirpation of the cervix per vaginam (Zweifel); (3) cesarean section, suture of the uterus and abdomen, and then vaginal hysterectomy (Olshausen); (4) cesarean section and total hysterectomy per vaginam (Dührssen); (5) panhysterectomy and the extraction of the child after removal of the uterus (Bland Sutton).

C. G. Cumston² condemns the old idea that a pregnant woman afflicted with **carcinoma of the cervix** is practically lost to all the resources of medical science, and that everything must be sacrificed to save the offspring. A review of statistics of such cases treated without surgical intervention shows a maternal mortality of from 40 % to 50 %, and an infantile death-rate, according to some authors, of 63 %. And of the children born alive a large proportion died in a brief period. He is convinced that pregnancy and labor decidedly increase the progress of the carcinoma, and that in many instances the extension of the neoplasm becomes very rapid, seriously affecting the general condition of the patient, sometimes resulting in death before labor begins. In view of these facts there has been in recent years a more general resort to surgical treatment of carcinoma during pregnancy with compara-

¹ Jour. of Obstet. and Gyn., Brit. Empire, Feb., 1902.

² Am. Jour. Obstet., Jan., 1901.

tively favorable results, and Cumston closes a comprehensive and careful study of such cases with these conclusions: If the carcinoma can be radically removed, the life of the mother alone is to be considered. Up to the beginning of the sixth month of pregnancy vaginal hysterectomy is the operation of choice, but after this period is past abdominal hysterectomy or Dührssen's vaginal cesarean section, followed by hysterectomy, is indicated. When the neoplasm is inoperable, the life of the child must be considered; but if the progress of the growth is such that the mother becomes rapidly cachectic, thus compromising the fetal vitality, pregnancy should be interrupted. Palliative treatment only should be instituted, because partial operations on the neoplasm usually produce miscarriage, and the mother is not materially benefited by them. Cesarean section at term may be done; but when the uterus is left, there is danger of septicemia, and consequently Porro's operation is the one of choice, if the periuterine tissues are not infiltrated to such an extent as to render this procedure dangerous.

[It is not very often that **ovarian tumors** are detected and removed during pregnancy, since it is usually their obstruction to delivery that first leads to the diagnosis.] But Lowenberg¹ believes [and correctly] that if detected they should be removed, since if situated in the pelvis they make delivery most difficult and dangerous, and if higher up the frequent post-partum torsion of the pedicle makes the prognosis of operation much more unfavorable. The danger of interruption to pregnancy in such operation has become small through advance in technic, and the tumor's rapid growth during pregnancy is very likely to cause interruption of pregnancy without operation. Operation between the second and fourth month is the most favorable to continuance of pregnancy. He reports a case in which, in spite of the difficult complication of a twisted pedicle, an ovariectomy on one side and a resection of the ovary on the other were performed without producing abortion. [This case testifies anew that an existing pregnancy offers no contraindication to operation.]

Doran² cites the remark of Sir John Williams that ovariectomy had proved as successful during pregnancy as apart from pregnancy, while the mortality associated with obstetric operation undertaken in cases of labor complicated with ovarian tumor was appalling. Other recent records and his own operative experience confirm the prevalent teaching that an ovarian tumor detected during pregnancy should be removed, that its removal may be the best course during labor, and that a tumor of this kind is liable to undergo in the puerperium prejudicial changes which indefinitely increase the dangers of operation.

[In view of the great advances made in the operative treatment of **fibroid tumors of the uterus**, the treatment of cases of pregnancy complicated by the presence of these tumors has undergone a certain amount of change.] This subject is considered by Archibald Doran,³ who arrives at the following conclusions: (1) In the great majority of instances in which fibromyomas of the uterus and pregnancy coexist

¹ *Centralbl. f. Gynäk.*, Dec. 21, 1901.

² *Lancet*, Feb. 8, 1902.

³ *Lancet*, Dec. 28, 1901.

the course of the pregnancy and of the subsequent labor is not seriously influenced by the tumor; but in a small proportion of cases the patient's life and the life of the child are seriously endangered. (2) When pregnancy is found to be complicated by fibroid tumor, it is best to allow the pregnancy to go to term, as long as the mother's health is not seriously endangered. (3) If at the onset of labor, or shortly before, it seems certain that the tumor will cause obstruction to the birth of the child, cesarean section, followed by hysterectomy, should be performed. (4) In cases in which the death of the mother makes it necessary to interfere in the earlier months, abdominal section should be performed and an attempt made to enucleate the tumor. (5) If under these circumstances myomectomy is found to be dangerous, hysterectomy should be performed.

PREMATURE SEPARATION OF THE PLACENTA.

R. W. Holmes¹ ends an exhaustive study of 200 cases in the literature with the following conclusions: (1) The etiology of *ablatio placentæ* is generally dependent upon pathologic conditions, and exceptionally on traumatism. (2) As a pathologic entity, *ablatio* occurs in about 200 pregnancies, and is of clinical importance once in 500. The difference between the occult and open types is largely dependent upon the manifestation of external bleeding in the latter; the complete blood retention in the former generally produces an exaggeration of the uterine distention, and accessory tumor, and more evident shock. (3) To put it in a paradox, *ablatio* is an abortion in the latter months of pregnancy. The etiology is nearly identical; the mechanism has certain elements of similarity. Those cases of pathologic interest, and mild instances, offer a parallel to threatened abortion; the patient may, and often does, tide over the difficulty and goes on to term with a living babe; the severe may be likened to an inevitable abortion, relief coming only with the evacuation of the uterus. The treatment demands these considerations: (4) The mild cases must be most carefully watched. Quiet is a *sine qua non*; it may be induced by morphin. An icebag on the uterus will be of use. Hydrastinin, which, according to Pick, has a selective action on contractions of unstriped muscle, and therefore possesses hemostatic action, may be given instead of ergot. From the remarks under the caption of frequency, it is evident that probably in nearly two-thirds of the cases pregnancy will go on to term, or labor will be completed, without untoward results. (5) Severe cases: Treatment must be modified by the condition of the os. If the os is prepared for delivery, use forceps, craniotomy, and version, choosing the operation in the order named; version should be selected only when unimpeded breech extraction is impossible. (6) Severe cases not in labor. As rapidly as possible labor should be induced; this may be done by means of friction, electricity, ergot, quinin, and sugar; hydrastinin, salt solution, gelatin solution, and general stimulation will be indicated *pro re nata*. While these

¹ Am. Jour. Obstet., Dec., 1901.

measures are being carried out, possibly by assistants, preparations should be made to introduce a Barnes bag. This measure, while dilating the os, is a most excellent means of stimulating uterine action; traction on the tube stem of the bag should be continued, which accelerates dilation and augments the cervical irritation. Later, dilation may be completed by larger bags, manual dilation, or, when effacement is complete, by Dührssen's incision; Dührssen's incisions have no consideration if dilation is present without effacement, and the author suggests that the oblique cuts offer less danger than those suggested by the originator. Version is then required. (7) Severe cases in labor. Hasten labor as much as possible; use the plan outlined in 5 and 6 as may meet indications. (8) A tampon should have no place in the treatment of ablation. The membranes should be preserved intact until delivery may be expedited. (9) Cesarean section will be of value in selected cases, but never will be popular, for the conditions and surroundings favoring celiotomy will seldom be at hand. (10) If the placenta does not follow the child at once, remove it immediately. Have all necessary equipment at hand to treat postpartum hemorrhage, which is a frequent sequence of the condition. Tampon the uterus early. (11) To quote Goodell's closing remark, "*Præstantissimum remedium est fœtus extracto.*" Apply this precept too early rather than too late. Schultze,¹ by placing a placenta just separated from the uterus in a basin of warm water with the uterine surface above, and filling the open vein of the excised cord with warm fluid by means of a syringe, demonstrated that the pressure on the fetal vessels may be raised very greatly without a drop of the fluid flowing from the uterine surface of the placenta. So one can separate the cotyledons of the placenta without any blood escaping from the distended vessels. But if a cotyledon is cut only slightly with a knife, the blood gushes forth. Thus he proved that the loosening of the placenta from the uterine wall causes no injury to the fetal vessels; that, therefore, upon the premature separation of the placenta the fetus loses no blood and does not die of anemia. Its pallid appearance is through death from asphyxiation, while its internal organs are still filled with blood. If, through contraction of the uterus, the placenta is thrown into the maternal abdominal cavity, the child cannot lose a drop of blood.

PLACENTA PRÆVIA.

A study of this condition by J. Clarence Webster² is summarized as follows: The causes are low implantation of the ovum, development of chorionic villi on the decidua reflexa, forming a reflexal placenta, or a combination of these two. Reflexal placenta is probably a frequent cause of abortion and miscarriage, by degeneration and thinning leading to hemorrhage. A case which reaches full term is generally one of low implantation of the ovum; if abortion take place in the later months, it is probably reflexal placenta. In all cases of placenta prævia hemor-

¹ Canad. Pract. and Rev., April, 1901.

² Jour. Obstet. and Gyn., Brit. Empire, Mar., 1902.

rhage may result from causes independent of the position of the placenta. In many cases of accidental hemorrhage a reflexal placenta is probably present.

Smyly¹ remarks that the uterine segment plays a most important part in all cases of placenta prævia, for not only is the growth of the placenta in this part of the uterus the essential feature of the condition, but its protection from injury during parturition is the principal duty of the medical attendant. How the placenta comes to be developed in this part of the uterus is an interesting question, but it is most probably due to low implantation of the ovum and to the involvement of the decidua vera and reflexa in its formation; and that these conditions result from endometritis is most certain, since placenta prævia most frequently occurs in women who have borne many children in quick succession, who have had abortions, and who have suffered from menorrhagia and leukorrhea, or, in other words, who are suffering from chronic metritis. When the ovum enters the uterus, it probably adheres to a part of the mucous membrane prepared for its reception, or slips into a cleft in that membrane; but when the membrane is rendered unsuitable by disease in that part, it becomes attached elsewhere, probably lower down; and if this part is not quite healthy, the serotina develops an imperfect placenta, insufficient for the needs of the fetus. The placental formation, therefore, spreads further afield, involving the reflexa or vera, or both. In this way it may spread not only into the lower segment of the uterus, but even into the cervix; and cases have been reported by Weiss and Ponfick in which it extended to the os externum.

The development of the placenta upon the decidua reflexa is especially interesting, and explains a number of facts observed in these cases which would otherwise be unintelligible. For example, the wide area covered and the extreme thinness often observable in these placentas, and the position of the placenta over the os uteri; but these are easily understood when we remember the expansion of the decidua reflexa during the growth of the ovum, and its union with the vera in the lower segment. It also explains some remarkable cases recently published, in which, though the placenta could be distinctly felt within the os, there was no hemorrhage during labor. In some cases of uterine catarrh the reflexa fails to unite with the vera, and if this occurred where the placenta had developed upon the former, there would be no vascular connection with the lower segment, and consequently no hemorrhage. In the vast majority of cases, however, the reflexa and vera unite, and the placenta derives its vascular supply from the lower segment, and as it is only a specially modified portion of the fetal envelope when situated at the lower pole of the ovum, it behaves as a part of the membranes; that is to say, it is separated from its attachments as far up as the contraction-ring, just as they would be under similar circumstances. The vessels of the placental site are thus torn through, and violent hemorrhage is the result. These hemorrhages usually commence about the seventh or eighth month of pregnancy, slight at first,

¹ Boston M. and S. Jour., July 25, 1901.

but recurring with increased severity. In some cases, however, there is no loss of blood till labor sets in, and these are generally cases of complete placenta prævia, and are probably cases in which, owing to the abnormal resistance, no lower segment is formed during pregnancy. Hemorrhage is the only symptom and the chief danger in placenta prævia, and to arrest or control it is the chief duty of the medical attendant; and in order to do so successfully he must carefully consider the conditions which are present.

Cesarean Section for Placenta Prævia.—An editorial¹ says that the recent advocacy of this radical treatment for placenta prævia demands a word of comment and caution, and, possibly, a word of condemnation. The one argument in its favor is that it reduces the fearful fetal mortality in these cases. But the question is whether an increased maternal mortality will not ensue if such procedure is extensively adopted. The splendid results attained by Fry,² of Washington, who employed bipolar version, thus saving 14 mothers and 5 children in 14 cases of placenta prævia, and by De Lee, of Chicago, in the use of the tampon in a series of 25 cases without maternal mortality, show pretty conclusively that, if proper care is taken, the maternal death-rate may be very satisfactory. This condition is rarely recognized until the labor is in progress. It is usually diagnosed and treated by the general practitioner, and he is generally better equipped for the treatment of this complication by version, and other conservative methods, than by cesarean section; and if such radical teaching should be disseminated and adopted, we believe the maternal and fetal mortality would be increased. It is unfair to apply to these cases of ectopic placenta the admirable statistics of Zweifel, Olshausen, Reynolds, and others, who have reduced the mortality of the cesarean operation to 3 % in elective cases for contracted pelvis. The pathologic condition is essentially different, the choice of time for operation, and often the diagnosis of lesion, radically different, and the results will vary materially. Cesarean section for placenta prævia will, probably, always be a dramatic maternity-hospital operation, only applicable occasionally, and never generally adopted by the rank and file of medical men for the relief of the dangerous complication of gestation. Higgins³ reported the results of 75 cases of placenta prævia, of which 56 were treated in hospital wards and 19 in the out-patient service in their homes. Among the house cases there were 6 deaths, a mortality of 10.7 %. Of these 6, 5 were complete placenta prævia. Of the 19 out-patients, there were 2 deaths, one of the complete and one of the incomplete variety of placenta prævia, a mortality of 10.5 %. Of the 75 cases, there were 8 deaths, a mortality of 10.6 %. These cases were treated by the use of the tampon and occasionally by the employment of forceps. Sixty-two per cent. of the children were born prematurely. The method of treatment described and most usually employed consisted in the induction of labor as soon as the diagnosis is made by rupturing the membranes and packing the vagina tightly with dry sterile gauze. Under the

¹ Amer. Med., June 29, 1901.

² N. Y. Med. Jour., Aug. 17, 1901.

³ Boston M. and S. Jour., Jan. 2, 1902

influence of the gauze packing hemorrhage is controlled and dilation proceeds, and, if necessary, the patient can be finally delivered by forceps or version. The purpose of this paper is to criticize the performance of cesarean section for placenta prævia. The writer quotes the results of 32 cesarean operations in the Boston Lying-in Hospital during the last 5 years, with 3 maternal and 3 fetal deaths, a mortality of 9.3 %. He believes that the general mortality of the cesarean operation is about 10 %. He gives 3 quotations from American writers, but makes no reference to the foreign literature of the subject. He draws attention to 3 cases of placenta prævia recently operated upon in the vicinity of Boston, with a mortality of 66.6 %. In the discussion, Worcester would not condemn cesarean section for placenta prævia. He drew attention to the fact that aseptic precautions are more easily exercised in abdominal section than in prolonged labor with repeated vaginal packing. In placenta prævia the cervix is easily lacerated, and while he was satisfied with the ordinary methods of treatment in cases in which the placenta is not central, in central placenta prævia he believed that there existed a field for the modern cesarean operation. Donoghue has performed cesarean section twice for placenta prævia, with the recovery of 1 mother and 2 children. He believed that when the placenta is central cesarean section is indicated. It is also indicated in incomplete placenta prævia when malpositions are present, and when the mother has been delivered previously by operations. Others spoke in favor of cesarean section when the os and cervix are tightly closed, the placenta central, the patient in good condition and in the hands of an operator competent to perform abdominal section. During the discussion of this paper attention was called to the fact that obstetric cases are usually in the hands of those incapable of performing abdominal section. While this may be true in many cases, it is not in all, and is a condition which should not be so. No one is competent to attend obstetric cases who cannot deal with ruptured ectopic gestation by abdominal section or labor in contracted pelvis, or who cannot operate in any manner to save the life of mother and child. Zinke¹ firmly believes that the cesarean and Porro operations are perfectly legitimate and elective procedures in all cases of placenta prævia, central and complete, and especially so when the patient is a primipara, when the os is closed and the cervix unabridged, when hemorrhage is profuse and cannot be controlled by tampons, and separation of the placenta around the internal os is difficult or impossible. Ehrenfest,² on the contrary, is opposed to this method of treatment. [It is not possible yet to say what place hysterotomy and hysterectomy will occupy in the treatment of placenta prævia. In placenta prævia treated by the vaginal method there is "unavoidable hemorrhage," and this is sometimes, or even frequently, fatal. The abdominal methods offer a plan by which all hemorrhages can be avoided; and, given asepsis, proper environment, and experienced operators, the mortality may be far below the present mortality from placenta prævia. That proper conditions will too often

¹ Am. Gyn. and Obstet. Jour., Oct., 1901.

² Amer. Med., Jan. 11, 1901.

be out of reach is obvious, but they are not far out of reach in many of our big towns, and unless some vastly improved method of vaginal treatment should be devised, there may be a future for the abdominal methods here under discussion.]

ABORTION.

The Statistics of 100 Cases of Abortion.—An editorial in the "Lancet," April 19, 1902, states that since the days of Hippocrates, who was one of the first to express this view, some obstetric writers have been accustomed to regard an abortion as more dangerous to the mother than a full-term delivery. That the danger of such an accident, if it be properly treated, is not so great as is often supposed is shown by Blondel in a paper read before the Obstetrical Society of Paris. In this paper he records the results of 100 cases of abortion, without a single fatal result, which had occurred in his private practice during a period of 12 years. The exact mortality of cases of spontaneous abortion is difficult to ascertain, but it is probably less than that of full-term confinements. Even the mortality following abortion criminally procured is really quite small, and it seems certain that Tardieu, who met with 60 deaths among 116 cases, had quite an exceptional experience. Brouardel, for instance, mentions 72 cases of criminal abortion without a death, and among Blondel's 100 cases 52 were certainly of such a character, and possibly 26 of the remaining cases were of the same kind. The proper treatment of a case in which there is reason to suspect that criminal measures have been used is always a difficult matter to decide in the absence of positive indications for interference, such as evidence of septic intoxication or septic infection, or the retention of portions of the ovum. Blondel recommends the following plan of treatment, which he pursues in all cases in which there is reason to suspect that criminal intervention has taken place. The uterus is curetted with the finger and with a curet. It is then swabbed out with glycerin of creasote of a strength of 1 in 3, is douched out with tincture of iodine, and a gauze drain dipped in glycerin of ichthyol (1 in 10) is introduced. The drain is changed every two days; at the same time the uterus is flushed out with a solution of mercuric chlorid. The results obtained are certainly very good, but it is a question whether they would not have been equally as good with a less energetic plan of treatment. It is to be noted that in 60 of the cases the fetus and placenta had already been expelled from the uterus when they were first seen. The most interesting part of the paper concerns the methods by which the criminal abortion was induced. Of the 100 cases of abortion which came under Blondel's notice, 52 were purposely procured. In 22 of these a midwife was the culprit, and in no less than 19 instances the patients carried out various manipulations upon themselves. On 15 occasions the midwife passed a sound, and on 10 occasions a gum-elastic catheter was used and an injection, presumably intrauterine, was given. According to Brouardel, this is one of the commonest

means employed by French midwives. Some of them, with a view of still further swindling their clients, are accustomed to inject so-called "eau d'argent" or "eau d'or," in the form of colored water, for which a correspondingly larger sum has to be paid. In two cases the patients had procured abortion upon themselves, in one instance by introducing a knitting-needle, and in the other instance a bone knitting-pin, into the uterus. In nearly all cases in which the patient had succeeded in passing instruments of this kind into her own uterus the organ has been found to be somewhat prolapsed. It is difficult to believe that any woman can succeed in such a manœuvre unless such a condition of the uterus is present. The fact that Blondel, even when there was no doubt that instrumental interference had been carried out could detect no wound or abrasion of the cervix, sufficient to swear to as evidence, is not at all exceptional. It is only, as a rule, when the patient dies that any trace of what has been done can be found, and even then great care must be exercised in the interpretation of any supposed sign of injury.

EXTRAUTERINE PREGNANCY.

Interesting cases of ectopic pregnancy are recorded as follows: Macnaughton-Jones,¹ a case of ectopic pregnancy (Fig. 44) complicated with septic infection of the sac, resulting fatally on the seventh day after operation; A. H. G. Doran,² a case in which the gestation sac lay entirely anterior to the uterus; Demons and Fieux,³ tubal pregnancy developed in an accessory diverticulum; C. G. Davis,⁴ a successful abdominal pregnancy operated upon through the posterior vaginal vault; C. H. Hare,⁵ a tubal pregnancy with double pyosalpinx; W. H. Humiston,⁶ a case of tuboabdominal pregnancy; J. E. Pickard,⁷ a case of primary abdominal pregnancy resulting fatally; and Tuholske,⁸ a case of ampullar tubal pregnancy of the right side with tubal abortion—the gestation sac being completely extruded unruptured; the placenta became implanted on the liver and the fetus went on developing to term; the patient died 32 hours after the removal of the child. Krusen⁹ reports a unique case. The patient was 34 years old, and had been several times pregnant, repeatedly miscarrying; one abortion was followed by an attack of pelvic inflammation. Two years after the last normal pregnancy, and 6 weeks after the last period, the patient was seized with symptoms of acute internal hemorrhage; they recurred with distinct fever, and Krusen operated. The peritoneal cavity was full of dark clots, and in the first handful which he extracted the operator detected part of a ruptured tubal sac and 3 perfectly well-developed fetuses, all in the second month of gestation. The seat of the pregnancy was entirely limited to the right tube; the rupture did not involve the corresponding cornu of the uterus, so that there was no question of cornual, uterine, or tubo-

¹ Lancet, June 29, 1901.

² Gaz. Hebdomadaire de Médecine et de Chirurgie, May 1, 1902.

³ Boston M. and S. Jour., Dec. 26, 1901.

⁴ Canad. Pract. and Rev., May, 1901.

⁵ Am. Gyn. and Obstet. Jour., Dec., 1901.

⁶ Lancet, Sept. 14, 1901.

⁷ Amer. Med., Oct. 19, 1901.

⁸ Amer. Med., Sept. 28, 1901.

⁹ Amer. Med., Jan. 4, 1902.

uterine pregnancy. The left tube was inflamed and adherent, but intact. Thus the three fetuses had developed, it would seem, in one tubal sac. This was removed with ease after division of its pedicle. Unfortunately, the patient was in a state of collapse, while inflammatory changes were not absent, and though intravenous transfusion and flushing of the peritoneum was practised she did not survive the third day. No necropsy was permitted. Krusen quotes one other instance of triplet tubal pregnancy; also a triple unilateral ectopic gestation, but in this case there were twins in a tubouterine sac on the right side, while the third fetus lay in the fimbriated end of the right tube; that is to say, in an ampullary sac. In Krusen's case there was an ampullary sac alone, and it held all three fetuses.

Cases of recurrent extrauterine pregnancy are reported by Stahl¹ and W. Philipowicz.² In Stahl's case the two pregnancies occurred 15 months apart, and each was removed by operation. He concludes that one pregnancy in a tube does not necessarily produce sufficient change to prevent a second pregnancy in the same tube. Philipowicz reports a case of extrauterine pregnancy, remarkable because



Fig. 44.—Gestation sac with fetus: the upper cavity shown in the illustration is that in which the septic fluid was contained (H. Macnaughton-Jones, in *Lancet*, June 29, 1901).

of the conditions found at the second operation. The operation for the patient's first pregnancy, which was extrauterine, was in May, 1898. The abdomen was opened in the median line and the gestation sac was so firmly adherent to the abdominal wall and intestines that, considering the patient's weak condition, it was not deemed advisable to remove it. It was incised; the fetus, 8 cm. long, was removed, also the placenta; then the cavity was tamponed with iodoform gauze. The cavity closed rapidly and the woman left the hospital with a small superficial wound. She returned 2 years later, in December, 1900, in the second month of pregnancy, evidently suffering from a ruptured ectopic gestation. When the abdomen was opened, the small pelvis was filled with old and fresh

¹ *Am. Jour. Obstet.*, Oct., 1901.

² *Wien. klin. Woch.*, No. 13, 1902.

blood-clots. The removal of these showed a fetus in the left tube, which was resected and the fetal sac removed. All of the firmly organized adhesions of mesentery, intestines, and abdominal wall present at the first operation had disappeared, the inner genitalia were all entirely free, and there was no trace remaining of the former gestation sac, which had evidently been entirely absorbed.

Double Extrauterine Pregnancy.—Frederick¹ reports a case of **simultaneous rupture of double tubal pregnancy** in a multipara, aged 38, who was seized with symptoms of ruptured tubal pregnancy. There was clinical evidence of rupture 10 days previously. The pelvis was found full of clots on both sides, and both tubes were ruptured, being alike the source of hemorrhage. Frederick claims this case as unique; no details further than the above are given.

Coexisting Extrauterine and Intrauterine Pregnancy.—[Of all the complications to which pregnant women are exposed, ectopic gestation is perhaps the least frequent. Only 88 such cases have been reported since the year 1708. No pathologic condition can be especially charged with the occurrence of this condition. The diagnosis is extremely difficult, and has rarely been made before rupture of the ectopic sac, abortion or delivery at term of the uterine fetus, laparotomy, or autopsy. The duration is variable; both pregnancies are generally interrupted, the one by abortion or premature labor, the other by rupture of the sac or death of the embryo. There are cases on record in which both were developed to term and both children were born alive. The prognosis is grave for the mother as well as for both children.] E. G. Zinke² believes that the treatment will have to be expectant and the patient kept quiet if the diagnosis be made before any of the afore-mentioned accidents take place. Cases of this condition are recorded by H. P. Perkins,³ F. V. Cantwell,⁴ Kochanoff,⁵ and Warnek.⁶ Vilsin,⁷ by a careful study of the literature,—going back to the eleventh century,—was able to collect 68 unimpeachable cases of this condition, to which he adds one observation of his own. Some of the most interesting results of his painstaking investigations are the following: In 20 cases both children reached entirely or almost full term. Interruption of the intrauterine pregnancy has by far a slighter effect upon the further development of the extrauterine pregnancy than vice versa. Disturbances in the blood-circulation in close neighborhood to the uterus, caused by the rupture or abortion of the pregnant tube, are in many cases responsible for the premature interruption of the intrauterine pregnancy. In 25 cases the ectopic fetus reached full term. This fact is striking. Engström does not consider this a mere accident, but believes that the increased afflux of blood to the pelvis, on account of the intrauterine pregnancy, improves at the same time the blood-supply of the pregnant tube, thus promoting the development of the ectopic fetus. The diagnosis is always very difficult. During the first three

¹ Am. Jour. Obstet., Nov., 1901.

² Am. Jour. Obstet., May, 1902.

³ Boston M. and S. Jour., Mar. 20, 1902.

⁴ Med. Rec., April 20, 1901.

⁵ Centralbl. f. Gynäk., No. 2, 1902.

⁶ Ibid.

⁷ Centralbl. f. Gynäk., Jan. 11, 1902.

months the diagnosis will be either intrauterine pregnancy complicated by pyosalpinx or simple extrauterine pregnancy, the uterus always being somewhat enlarged in this condition. In a later stage it will be more than difficult to avoid the wrong diagnosis of a retroflexion of the pregnant uterus or intrauterine pregnancy complicated by ovarian tumor or pyosalpinx. The treatment of this condition is, of course, identical with that of ectopic pregnancy in general. [The possibility of such a condition may prevent those who are too ready with the use of the uterine sound from using it for a diagnostic purpose in cases of suspected ectopic pregnancy.]

Ovarian Pregnancy.—Webster¹ reviews briefly the subject of ovarian pregnancy. He cites from his monograph published in 1895, on ectopic pregnancy, in which he says that after a study of records of alleged ovarian gestation, there was no proof that a pregnancy had ever started in a graafian follicle, and that it seemed to him that such an occurrence was improbable, though he did not commit himself to the statement that it was impossible. He mentions the case of Van Tussenbroek, demonstrated at the Third International Congress of Gynecology at Amsterdam, in 1899. He says this exhibition served to confirm the belief of those members of the congress who had always recognized the possibility of the occurrence of ovarian gestation, and dispelled the doubts of others who had always been skeptical. There are several conditions which closely simulate ovarian pregnancy. Pregnancy in an accessory tube may easily be mistaken for ovarian pregnancy, if the ovary of the same side becomes closely adherent to the pregnant tube and a normal tube is found independent of the gestation sac; also, if the ovary was very small or absent, and the gestation sac lay behind the normal tube; or when the pregnancy takes place in an accessory fimbriated extremity or in a diverticulum of the tube. A mistake is easily made in the case of a gestation which begins on the ovarian fimbria. In a similar manner a pregnancy growing at any part of the fimbriated end of the tubes may so involve the ovary that it may be regarded as the original seat of the pregnancy. He gives Van Tussenbroek the greatest credit for the thoroughness with which she has investigated her specimen, and while her work was of value, he is not yet convinced. He admits that section through the ovary demonstrates very closely that the pregnancy was undoubtedly situated in the organ, and that while the gestation may be readily conceded to be topographically ovarian, it is a matter of some doubt whether the ovum was at first implanted in true ovarian tissue. He says that Van Tussenbroek's claim that an ovum was fertilized in its follicle is a pure assumption, and in no sense proved; that undoubtedly the microscopic appearances have strongly suggested this view to her, but these same appearances are capable of other interpretations. He remarks that the investigations of Berry Hart and himself have made evident the unreliability of all published accounts of the primarily abdominal variety of ectopic gestation. [This statement is sweeping

¹ Amer. Med., 1901, vol. II, p. 993.

in its scope, and we would prefer to accept it merely as an opinion and not as a verified fact. In discussing the possibility of true ovarian pregnancy, Lawson Tait laid down certain conditions which must be fulfilled before a definite assertion of its presence could be made. Thus, both of the fallopian tubes and one ovary must be found absolutely intact; the other ovary must constitute the gestation cyst, and in the cystic wall there must be found microscopic evidence of ovarian tissue. Condamin¹ has recently had under his care a case in which these conditions were, he believed, sufficiently fulfilled for the purpose of definite distinction. His patient, who is now 39 years of age, was married at 18, and miscarried 6 months afterward. In November, 1893, she ceased menstruating, and during the following months presented the usual signs of pregnancy. In July, 1894, abdominal and sacral pains occurred and lasted for 4 days, and the breasts became filled with milk. Menstruation reappeared 2 months later, and the patient declared that for 3 years the size of the abdomen progressively diminished. In November, 1901, she suffered from renal colic. When examined at this time, the right side of the abdomen was found to be occupied by a hard tumor, which extended to a little above the umbilicus. The cervix uteri was displaced to the left. At the operation a large white cyst was found, taking origin from behind the right broad ligament. The uterus was displaced to the left, but both it and the two fallopian tubes were of normal size and appearance. The left ovary was a little enlarged but healthy. The tumor had to be freed from the appendix and intestines. The pedicle was of moderate size and corresponded to the entrance of the vessels. No trace of a right ovary could be found after the removal of the cyst. The patient made a rapid recovery after the operation. The walls of the cyst were uniform, white, and pearly in places. The fetus was well developed and not calcified. The placenta was implanted at the point of entrance of the ovarian veins. The cyst-wall was unfortunately not examined histologically until it had been for some time in Müller's fluid. The most that could be said was that it gave the visual and tactile impression of certain ovarian cysts, and it was hardly probable that after 7 years distention unmodified ovarian tissue would be seen. Other cases of supposed ovarian pregnancy are reported by Anning and Littlewood,² M. Robson,³ and W. R. Pryor.⁴ Pryor's case revealed at operation a viable fetus.

Interstitial Pregnancy.—Instances of this form of ectopic pregnancy are reported by Guérard,⁵ R. H. Pierson,⁶ and A. Laphorn Smith.⁷

The Formation of Decidua in the Fallopian Tube in Tubal and Intrauterine Pregnancy.—Lange⁸ considers this question at length, and gives the results which he has obtained in the examinations of specimens from 20 cases. He has observed that just as in the gravid uterus there is the forming of a decidual membrane, so in the gravid tube,

¹ Lyon Méd., Mar. 2, 1902.

² Brit. Med. Jour., June 14, 1902.

³ Centrallbl. f. Gynäk., Dec. 9, 1901.

⁴ Montreal Med. Jour., Aug., 1901.

⁵ Monatschr. f. Geburts. u. Gynäk., Bd. xv, Heft 1, 1902.

⁶ Lancet, April 27, 1901.

⁷ Med. Rec., Mar. 15, 1902.

⁸ N. Y. Med. Jour., Dec. 7, 1901.

to a less extent and with variable formation, a decidua can exist. It is usual for decidua to form in the womb in most cases of pregnancy. He finds that cases are reported showing that in tubal pregnancy decidua is formed in the nonpregnant tube, and also in that portion of the uterus which is most adjacent to the tube. He examined a second series of 5 cases, and concludes from this investigation that the mucous membrane of the fallopian tube, like that which lines the uterus, has the property of forming a decidual membrane. For this to happen the ovum must not only be in contact with the mucous membrane, but the impregnated ovum must form its attachment to the tube or to the uterus. The capacity of the mucous membrane of the tube for forming decidual membrane is much less than that of the membrane of the uterus. In the early months of pregnancy the tube forms scarcely any decidual lining membrane. Except when the attachment of the ovum excites irritation in the tube during the early months of pregnancy, it is not uncommon to find the merest trace of decidual formation.

Tubal Pregnancy.—[In the eleventh century Albucasis described the first known case of extrauterine pregnancy. In 1875 Thomas was the first to operate for the relief of the hemorrhage attending the rupture of a tubal sac by boldly thrusting a galvanocautery through the vaginal wall, removing the fetus, and thoroughly cleansing the cavity with a carbolic acid solution. Tait instituted as a routine practice the treatment of this condition surgically.] T. Goodrich¹ points out that nearly all pregnancies are probably extrauterine in the beginning. Both the cilia in the fallopian tube and the uterine cavity move toward the cervix, and the spermatozoa work their way upward against this current. Spermatozoa are frequently found free in the peritoneal cavity. The cilia extend a short distance beyond the tubal opening and sweep the ovum into the tube as soon as it escapes from the follicle. The tube, however, is long and covered by delicate plications and deviations, so that the progress of the ovum is frequently impeded. Should any cause be sufficient to stop its progress, it may either die, or become attached to the mucous membrane and develop. Factors in the causation of this condition, therefore, may be easily understood: (1) A congenital narrowing of the canal. (2) A large or unusually shaped ovum, hydramnios, twins, encephalocele, etc. All primary deformities in the ovum have been noted in ectopic gestation. (3) Disease of the graafian follicle so altering the membrana granulosa as to make it more adhesive to the tube. (4) Excessive involution which has affected the tube as well as the uterus. This is considered an etiologic factor in isolated cases from the fact that the condition is much more rarely met with in multiparas. (5) A tumor of the uterus or ovary distorting or closing the lumen of the tube. (6) Most authorities believe that inflammation of the appendages or pelvic structures is the *casus belli* in many cases, and gonococcus is perhaps the most frequent invader. On the other hand, ectopic gestation seldom appears with double pus-tubes, probably because the pus kills the spermatozoa. The treatment of these cases

¹ St. Paul Med. Jour., Feb., 1902.

in their various phases is distinctly surgical. If surgical interference were withheld in all instances, only 5 % would recover, but in the hands of a skilled surgeon the mortality rate is less than 1 %. The time for operation may be questioned. Shock from hemorrhage is seldom a contraindication. If the condition be recognized before rupture, or if hemorrhage cease and a hematocele form, thorough preparations should be made for an aseptic operation. In the tuboabdominal variety when the eighth month has passed, some advise the postponement of operation until pain begins. The author believes in such instances the mortality is least when celiotomy is deferred at least 4 or 6 weeks after false labor has taken place, thus allowing time for separation of the placenta, which can be more readily removed without alarming hemorrhage. The etiology of extrauterine gestation is doubtless complex. That traumatism may play an important part has been suggested by Freund, and now Seeligmann¹ corroborates that view on the strength of the histories given in 5 cases, in all of which there had been an injury at the onset—specifically, a severe fall on the buttocks. The jarring caused by the fall seems to drive the fecundated ovum from the grasp of the fimbriated extremity of the fallopian tube or the ciliary stream of the tube.

LABOR AND THE PUERPERIUM.

Vaginal Douching in Obstetrics.—Wadsworth² advises the avoidance of douching in obstetrics unless it is particularly indicated. Antepartum douches frequently fail to remove pathogenic bacteria, when they are present; they destroy the natural protection of the vagina; they are liable to cause slight injuries to the vaginal wall through which infecting bacteria may gain entrance into the body; and, finally, pathogenic bacteria may be introduced by these manipulations. The routine management of cases should be freed as far as possible from all procedures which interfere with the natural resources of the body; for these, in the vast majority of cases, are sufficient protection against the invasion of pathogenic bacteria. In the few exceptional cases requiring interference, this should be determined by the bacterial examination.

Anesthesia in Obstetrics.—Partridge³ lays down the following rules as to the use of anesthetics in obstetrics: The anesthetic should be given during the latter part of the second stage. If its administration is begun during the latter part of the first stage and the beginning of the second, altogether too much would in many cases be given, for these two periods may last for hours. When the head is well down, nearly or quite upon the perineum, the pains become more frequent and more severe. Now is the time for the anesthetic. It should be given with the pain. Chloroform may be given on a handkerchief or napkin, folded and held at some distance from the face. One fact worthy of notice in connection with the whole subject of anesthesia in labor is that whether the anesthetic has been given to the obstetric degree only

¹ Deut. med. Woch., 1901, No. 26; Berl. klin. Woch., Aug. 26, 1901.

² Am. Jour. Obstet., April, 1901. ³ Canad. Pract. and Rev., April, 1902.

or pushed to the surgical degree, vomiting hardly ever occurs. So rare is it that when seen it always attracts attention and suggests some complication. Certain other agents have some anesthetic power. Among these chloral holds the highest place, and is lauded highly in many of the text-books, although the writer's use of it has been disappointing. It is usually recommended to give it during the first stage, to relieve the nagging pains and to relax the rigid cervix, which often delays progress. The dose usually given is 15 grains every 20 or 30 minutes for three doses. The writer has given it in this way in a number of cases, and has found that it was often vomited, and when retained seemed to have no analgesic or relaxing effect. In the case of rigid cervix nothing acts as well as a hypodermic of $\frac{1}{4}$ grain of morphin with $\frac{1}{150}$ grain of atropin. The patient usually sleeps 2 or 3 hours, and when she awakens and the pains begin, the cervix relaxes and the labor proceeds satisfactorily. Lepage and Lorier¹ recommend the use of pure ethyl chlorid as a general anesthetic in labor.

Cocain in maternity cases has been tried by several accoucheurs in Paris. Doléris² has been employing it in his service at the Boucicaut Hospital. The number of cases reported in the thesis of his assistant, Malartic, is 62. The usual dose was 1 cgm., sometimes 2. The results were good in 52 cases, and bad in 10. Malartic established the following conclusions: Analgesia lasts about 2 hours; the uterine contraction is excited, especially immediately after the injection; retractility is also induced; there is a certain hemostatic action; and, lastly, a slight degree of action on the contractions even outside parturition. As a result of this, intramedullary cocainization is the best anesthetic in all obstetric operations, with the exception of version (?). It is contraindicated in cases of pregnancy, on account of its abortive influence. It may be used in cases of parturition in which there is much pain, as a hemostatic, and as a means of inducing labor—for instance, in eclampsia. Doléris used this method in a case necessitating cesarean section, and the action on the uterus was so pronounced that it was not necessary to check the bleeding after the extraction of the child, as is usually done, by compressing at the neck of the uterus.

Spinal Anesthesia.—[The production of anesthesia by the injection of a solution of cocain into the spinal canal has now been carried out in a large number of varying conditions. We gave a review of the whole subject last year, in which we considered its advantages and disadvantages. Nothing has been published since that time to cause us to modify our opinions as to the value of this mode of producing anesthesia.]

Laceration of the Perineum.—[A number of essays have been written for the "New York Medical Journal," December 28, 1901, upon the causes and methods of preventing this annoying complication, which, if not repaired at once, frequently causes a great deal of misery later.] G. B. Twitchell says that the vulvar opening is not stretched as by an entering wedge, but by having the lower end pushed away

¹ Jour. de Méd. de Paris, 1901.

² Jour. Am. Med. Assoc., June 15, 1901.

from the upper. That is, if, in the swinging of the head, as it extends, it slides on the perineum, the space between the pubes and fourchet will increase; on the other hand, if the head does not slide during this swing, the opening will not increase and the perineum will follow the head. The best lubricant to facilitate this sliding is the natural one, and hence douches, frequent examinations, etc., are to be avoided. M. A. Walker urges the importance of emptying the rectum and bladder to give more room, as a preliminary step. During the latter part of the second stage all voluntary effort should be stopped as far as possible by encouragement not to "bear down," and later by chloroform. Too rapid advance may be avoided by pressure with the fingers pointing posteriorly and pressing against the (maternal) posterior segment of the head during each pain. Thus by retarding the advance of the frontal segment there is a tendency to increase flexion and allow the suboccipital region of the head to pass as far as possible underneath the pubes. The shortest diameter of the head thus comes in contact with the vulvar outlet, and the head should be slowly extended over the perineum between pains, taking care that the nose and chin are not born with a jerk. J. L. Andrews sums up the subject by advising (1) patient and persistent endeavor to bring the longest diameter of the presenting part in relation with the longest diameter of the outlet, and (2) the constant effort to secure perfect dilation of the soft parts. All writers advise against placing the fingers in the rectum to assist extension, on account of the danger of infection, and most of them express themselves as opposed to episiotomy.

Adhesive Straps for Prevention of Laceration of the Perineum.—

Believing that the frequency of perineal lacerations is evidence that the methods now employed are insufficient, George H. Noble¹ has made use of adhesive straps to take the strain off the pelvic floor and direct the shortest diameter of the presenting part in the true axis of the outlet, especially in forceps delivery. These straps should be applied after the occiput has passed the pubic arch and before the period of crowning is reached. The application should begin with straps 1½ inches wide and 18 to 24 inches long, attaching one extremity well upon the side of the labium and deep into the sulcus between it and the thigh; then passing downward and across the median line just behind the posterior commissure, it is continued on the opposite side around behind the buttock, and attached to the hip at or about the sacroiliac synchondrosis. The second strap is passed in a similar manner on the other side, and each one applied with as much tension as possible, drawing the labium well downward and the buttock upward. The third strap passes horizontally across the perineum at a level with the posterior commissure and is fastened on either side to the flexed thighs or hips. Noble has applied these straps in 6 forceps deliveries with perfect satisfaction, using them in cases in which the perineum appeared to be in imminent danger. [The danger of sepsis would be, we think, increased by this procedure.]

¹ Am. Jour. Obstet., Feb., 1902.

Prophylactic Perineotomy during Labor.—Mandelberg¹ describes 66 perineotomies performed during labor in one of the maternity hospitals of St. Petersburg. Of the patients, 62 were primiparas. The incision was made with a knife, in the central line, through the frenulum, extending from 2.5 to 3 cm. The lower extremity of the incision terminated in front of the sphincter of the bowel. The cut was made during a pain. After the uterus had been emptied the incision was closed under anesthesia. It is claimed for this method that it prevents more extensive and serious tear, that union is better, that it diminishes the resistance to the head at the latter part of the labor, that it prevents stretching of the uterine ligaments, and that it is in every way preferable to resistance to the head and to tear of the pelvic floor extending in several directions. [There is much to be said in favor of this procedure. Some of the worst tears of the perineum and pelvic floor occur because the attendant makes injurious endeavors to protect the parts. During labor no pressure should be made upon the perineum proper, and the edge of the hand which supports the parts should cover the anus, but should not extend higher upon the perineum. The perineum should be left free to dilate as the head emerges. The progress of the head should be regulated by the other hand of the attendant. Nature usually performs the operation described by Mandelberg. If no undue resistance is made to the exit of the fetal head, the tear is usually in the median line, is readily closed by suture, and heals without difficulty. In our experience, it is seldom necessary to cut the perineum, but it is better to allow a moderate tear in the perineum than, by our efforts to prevent it, bring about a manifold tear in the pelvic floor and vagina.]

Management of the Umbilical Cord.—According to C. S. Bacon,² nature's plan of removing the cord from the newborn child is by suppuration and inflammation. The method in common use is but little better than the primitive method of nature. Careful study of the dangers that attend the methods of separating the cord and postmortem examinations of babies dying 2 to 4 weeks after birth show that local inflammation of the navel and infection of the umbilical vessels are very common. Contrary to the common view, navel-cord separation is one of the most serious dangers that can menace the newborn. Management of the navel according to surgical principles is possible, and should be attempted. The cord may be severed close to the body or 2 to 3 cm. away. When a stump is left, antiseptic treatment is necessary. When amputation is done, asepsis should be striven for. In the first case alcohol is the safest and best antiseptic. It should be applied freely, especially at the junction of the cord and skin, before and after the daily bath. When the cord is tied at the junction of the skin and cord, an effort should be made to keep the navel aseptic; therefore no bath should be given. The best plan is to cut the Wharton jelly at the base of the cord and strip it back like a cuff and tie the vessels with fine silk or catgut. Then the navel must be kept perfectly sterile. This can be done only by a physician who has had some surgical experience.

¹ Centralbl. f. Gynäk., 1901, No. 46.

² Jour. Am. Med. Assoc., April 26, 1902.

Lactation and National Strength.—Italy, alarmed at the stunted growth of her children, invokes the aid of science and philanthropy to arrest physical deterioration. At the recent Congress for Hygiene of Lactation and the Care of Early Infancy it was pointed out by Ferruta ¹ that the principal reason why so many women were unable, with the best of will, to nurse their own infants was an economic one—poverty, insufficient food, and the necessity to labor (not vanity). He advocated an intense propaganda in favor of maternal suckling, backed by popular instruction as to why it is preferable to other methods of feeding; and he calls upon the ladies of the land to assist in this movement by gifts, precept, and example. In the discussion which followed it was suggested that charity should be invoked to provide poor women with better food during pregnancy and lactation, and that one month's rest from labor after confinement should be made compulsory by law. This was opposed by others, who considered private charity anarchical in its tendency, and compulsory rest an interference with liberty. It was finally resolved that in the opinion of the congress there should be instituted, in the cause of healthy development of the race, special sessions of free medical advice and instruction to poor nursing women as to the rational care of children during the first year of their existence; periodic visits to children and mothers; the gratuitous distribution, as far as means would permit, of sterilized milk and other healthful foods, when there was an insufficiency of maternal milk, or when lactation was interrupted by sickness of the mother. The congress also recommended the passage of suitable laws for the best possible protection of gravid and puerperal women.

MATERNAL DYSTOCIA.

Puerperal Eclampsia.—Braitenberg ² reviews the statistics of eclampsia in the Innsbruck Hospital, showing that 46 out of 8408 women delivered therein suffered eclampsia—5.47 %. In 4 cases the eclamptic attacks occurred before the beginning of labor, in 24 during labor, and in 18 after delivery. The earlier the attacks began, the greater they were in number and the greater the mortality. The writer discusses various theories of the etiology of eclampsia, and reports some cases in which he is convinced that the eclamptic convulsions were due to carbolic-acid poisoning, and others in which there was cerebral hemorrhage, which may have been the cause, or the result, of the eclampsia. [So numerous and varied have been the theories advanced as to the causation of eclampsia gravidarum, that it would be difficult to conceive of any new explanation, yet there is an element of originality in the experimental and critical investigation prosecuted by Blumreich and Zuntz, ³ and set forth in "Contributions on the Pathogenesis of Eclampsia."] They experimented on pregnant dogs and found that these animals are more susceptible to the convulsive action of creatin

¹ Il Policlinico, Feb. 1, 1902.

² Wien. klin. Woch., Feb. 13, 1902.

³ Arch. f. Gyn., Feb., 1902.

than nonpregnant dogs, thus demonstrating in the former a greater irritability in the cortical motor cells. In this experiment the creatin served as an index of the irritability of the cortical cells; the investigators did not intend to prove that it is creatin that is the cause of puerperal convulsions. They conclude that a series of poisons are at work in the same way; that probably other stimuli, possibly mechanical, have the same effect. They claim they have sufficient evidence to conclude that the same hyperexcitability of the cortical cells, together with the presence of irritant poisons, lies at the basis of eclampsia in human beings. The facts of pathology show a certain tendency during pregnancy to diseases of the motor zone. Besides eclampsia, which is not infrequent,—one case occurring in 400 or 500 pregnancies,—there are also met with tetany and chorea. They cite the observation of Windscheid, that whenever a woman is attacked with tetany, it is during pregnancy or the puerperium. Likewise the phenomena of chorea, when they appear in an adult woman, do so almost always during the condition of pregnancy and disappear with its termination. Chorea, an ordinarily benign disease, acquires under the influence of pregnancy a character that makes it frequently a direct menace to life. During the pregnant condition much weaker stimuli are necessary to evoke convulsions than during the nonpregnant condition. It has never heretofore been affirmed that during pregnancy, in the constitution of the cortex of the brain itself, there is present a particular contributing cause which makes the stimuli so much more effective and dangerous. The question hinges partly, therefore, on this: Are there in the cortex certain characteristic changes that lie at the basis of the convulsions? Since in pregnancy there are appreciable variations from the normal blood-distribution in the body, the authors incline to the thought that perhaps the increased supply of blood sent to the reproductive organs might lead to an imperfect nutrition of the cerebral cortex and occasion an alteration in the cells which would increase their irritability. At the same time, there would be a heaping up of the products of metabolism, which would include the toxic substances aforementioned. In the particular condition of irritability of the cortical cells that is present in eclampsia, it needs no search for any special stimulus or class of stimuli to arouse it, for it may be aroused by all possible kinds of stimuli or combinations of them. D. Berry Hart¹ briefly reviews Schmorl's work to show that eclampsia is due to a strong irritant developed in connection with the placenta, causing degenerative changes in the liver, lungs, and heart, as well as in the kidneys, and hence albuminuria is only one symptom of a systemic toxemia. This irritant he believes to be a fibrin ferment derived from placental giant-cells. This advance pathology has led to a modification of the treatment of eclampsia, and an avoidance of violent and depressing remedies is particularly urged. We must remember that various organs are undergoing changes, that the nature of the irritant is still hypothetic, and that we still do not know by what organ it is eliminated, if eliminated at all. When albumin is found,

¹ Practitioner, Dec., 1901.

a milk diet, rest in bed, attention to the bowels, and an occasional hot bath are all that is usually necessary. If headache and eye-symptoms supervene, induction of labor is indicated. If eclampsia has occurred, powerful purgatives, pilocarpin, and venesection should be abandoned as being too depressant. Chloroform is very valuable, and should be given at once to control the seizures. Begin with hypodermic injections of morphin, $\frac{1}{4}$ to $\frac{1}{2}$ grain and $\frac{1}{4}$ grain, repeated in 2 or 3 hours if necessary. The morphin treatment was first started in Germany, but is now fairly well accepted in England. The effect of morphin is more lasting than that of chloroform, and constant attention is not so essential. A large saline injection should next be given by the bowels, or an intravenous injection in very severe cases. Hot packs are beneficial, but oxygen inhalations seem to do little good. A minimum of judicious treatment seems most successful. Labor should be accelerated, but the rapid methods of Dührssen and cesarean section are seldom necessary. Heizfeld¹ says that out of 81 necropsies in eclamptics, 22 % of the cases showed a bilateral compression of the ureters. He says that in primiparas who give evidence of eclampsia during the period of cervical dilation urethral compression is exceedingly common. He believes that eclampsia is the expression of an intoxication due to the circulation in the maternal blood of toxins developed from her own and the fetal catabolism. This theory, which to his mind is equally tenable with that of uremic poisoning, points the way to prophylactic measures.

The Pathogeny of Puerperal Convulsions.—[This problem is still far from being satisfactorily cleared up. The limit that an excess of sodium chlorid in the blood is a factor may be taken from certain experiments on rabbits made by H. Schuhmacher.²] He injected solutions of salt, urine, and liquor amnii into the jugular or femoral vein. Weak solutions of common salt, even in large quantities, did no harm. The urine of healthy women who are pregnant and that of lying-in women showed more or less toxicity, but the variation did not seem to depend upon any time-relation to the process of parturition. The urine of puerperal women seemed the more poisonous, but the degree of its toxicity was connected with its specific gravity. The urine of women affected with nephritis gravidarum appeared no more deleterious than that of healthy women; the amount of albumin seemed to make no difference, but the degree of concentration was the determining element. The urine of women suffering with puerperal eclampsia showed itself highly poisonous, but only, the author implies, because it was a concentrated solution of sodium chlorid. Serum proved much more energetic, and every intravenous injection of it endangered the animal's life. This was the case also with the liquor amnii. In two cases of eclampsia and one of uremia, all three ending fatally, H. Cramer³ found a peculiar milky urine voided, suggestive of chyluria. The close chemical and microscopic examination, however, showed that the milkiness was

¹ Centralbl. f. Gynäk., Oct. 5, 1901.

² Beitr. zur Geburts. u. Gynäk., v. 2; Münch. med. Woch., Nov. 26, 1902.

³ Münch. med. Woch., Jan. 21, 1902.

due to innumerable suspended particles, albuminous in nature. Since in all three cases very much albumin was present on boiling, it is possible that the strange phenomenon was due to a supersaturation with albumin, especially since the urine cleared up upon sufficient addition of water. It is also possible that the suspended albumin is of a different nature from the dissolved albumin. From a prognostic point it seems that death is not far off when the emulsion is voided.

Treatment of Eclampsia.—[The treatment of this condition is varied. Within the last year a remarkable series of cases has been reported by Stroganoff. This series includes 58 cases which came under observation during three years—1898 to 1900. In all these cases a definite routine treatment was adopted, and absolutely no maternal mortality occurred. This result seems extraordinary in view of the latest statistics from various parts of the world quoted by Edgar, which place the maternal mortality at from 25 % to 35 %. According to this authority, experience does not permit of recommending any single treatment, since many subjects recover no matter what the treatment, many die in spite of treatment, and others do well without any treatment at all.] Stroganoff, whose views have been summarized by Newell,¹ of Boston, considers that puerperal eclampsia is an acute infectious disease which runs an almost indefinitely self-limited course of a few hours' duration, seldom exceeding 24, and still more rarely 48 hours in length. His treatment is designed to accomplish the following results: (1) The prevention of convulsions by lessening the irritability of the nervous system and by removing all external sources of irritation, especially those connected with the birth-canal. (2) The strengthening of the vital processes by careful supervision of the cardiac and pulmonary circulation, by securing as large a quantity of oxygen as possible, and by prompt delivery. If with these measures and a proper diet the convulsions do not cease, his treatment is in brief the following: The administration of oxygen during the convulsions; the use of morphin and chloral to control the seizures; the free use of cardiac stimulants when the heart-action weakens; prompt delivery when the convulsions do not yield to treatment; a milk diet and the avoidance of all methods of treatment which tend to depress the patient. [American obstetricians will probably differ somewhat with the treatment outlined. Many will condemn the use of morphin as a routine treatment because of its danger if serious organic disease of the kidney exists. Others will advocate *veratrum viride*, which reduces the temperature and pulse-rate, relaxes the rigidity of the cervical canal, and produces prompt diaphoresis and diuresis, thus eliminating the unknown poison. The employment of saline solution has been a valuable addition to the therapeutics of eclampsia, since it reestablishes the renal secretion and dilutes the toxic material present in the blood, as well as stimulates the general circulation. The majority of obstetricians have practically abandoned the teaching of Charpentière, of France, and Winkel, of Germany—namely, that the uterus in eclampsia should be let alone except after

¹ Boston M. and S. Jour., Feb. 20, 1902.

the full dilation of the os, as the irritation of inducing labor or artificially dilating the cervix precipitates convulsive attacks. The weight of medical opinion to-day is in favor of emptying the uterus in as short a time as possible in cases of eclampsia, whether the attack occurs before or during labor. The method of delivery to be selected will depend upon the environment of the patient and the surgical ability of the obstetrician. Cesarean section for the relief of eclampsia carries with it a high rate of mortality (over 36 %, according to Charpentière). Manual dilation of the cervix with the immediate extraction of the fetus appears to be the most popular method of procedure. However, as eclampsia occurs four times more frequently in primiparas than in multiparas, rapid manual dilation with extraction is sometimes quite difficult unless deep cervical incisions are made; but even if such radical procedures are necessary, the modern obstetrician need not be deterred, providing he is surgically clean in his manipulations. With our present knowledge the general treatment of eclampsia will remain symptomatic, and it is improbable that any routine treatment for the condition will find favor with American obstetricians. However, if such superb results as those reported by Stroganoff can be obtained by his method of treatment, it certainly demands our most serious consideration; no other reporter has presented such favorable statistics.]

Eclampsia and the Thyroid Gland.—Nicholson,¹ of Edinburgh, recently read a paper upon this subject before the Edinburgh Obstetrical Society. The discussion upon the paper appears in the "Scottish Medical and Surgical Journal," July, 1901. In the paper the author discusses the changes in the blood and circulation during pregnancy, drawing attention to the fact that there is always a toxemia as the result of fetal metabolism. There is during pregnancy increased vascular tension, due to hypertrophy of the cardiac muscle and the muscular coat of the vessels. Each pregnant patient, especially in her first pregnancy, is in a condition of toxemia in which the balance is easily disturbed and a dangerous condition might readily arise. He believes that there is an intimate relation between inadequate function of the thyroid gland and the mechanism which arrests the renal secretion. During pregnancy hypertrophy of the thyroid is usual. In 25 pregnancies in which the usual hypertrophy was absent Lange found albuminuria in 20. Thyroidin has a marked diuretic effect, but does not greatly diminish albuminuria. The writer cited the case of a multipara who had eclamptic convulsions and who was cured by the administration of thyroid, ultimately going to term and giving birth to a healthy living child. He drew attention to the fact that when the thyroid does not perform its function urea is not properly formed, and the action of the kidneys is deficient. He thought that eclampsia often resulted from substances produced in the liver which form in that organ because the thyroid does not act properly.

In treating eclampsia and the preeclamptic state by thyroid extract he would give 5-grain doses night and morning, and after a few days

¹ Scottish M. and S. Jour., June, 1901.

3 times daily. Proteid food should be entirely forbidden at first and very gradually resumed. When signs of eclampsia appear and a fit seems imminent, 10 or 15 minims of thyroid liquid should be injected hypodermically every hour or two. The fresh juice of a sheep's thyroid, 10 minims, with an equal quantity of distilled water, is more efficient. For the immediate treatment of the convulsions he would give $\frac{1}{2}$ grain of morphin. He thought well of saline transfusion in connection with thyroid and morphin. In the discussion of the paper Underhill remarked that if thyroid deficiency were the cause, eclampsia should be seen more frequently. The thyroid theory did not account for the frequency of eclampsia in primiparas. Hart recalled the cases of 2 myxedematous women who had borne children and who had no eclampsia. On the contrary, they actually improved in condition during their pregnancy, probably owing to the action of the fetal thyroid. He also reported experiments made on bitches in removing the thyroid while they were pregnant. Hart did not believe that the thyroid theory was sufficient to account for eclampsia. Haultain thought that the most important point in the paper was that regarding increased arterial tension. Whatever causes eclampsia does so by bringing about this abnormal tension. Iodothyron should be given a fair trial, as it may be found efficient in counteracting the effect of the toxins and dilating the vessels. Ballantyne stated that the last case of eclampsia narrated in the paper was under his own care. The apparent effect of the thyroid in this case was striking. He had found it a difficult matter to decide whether the thyroid was enlarging or not during pregnancy. In the Edinburgh Maternity Hospital the number of cases of eclampsia was remarkably large.

The Value of Veratrum Viride in Puerperal Eclampsia.—The "Therapeutic Gazette," August 15, 1901, publishes the following opinions of the value of veratrum viride in puerperal eclampsia: J. C. Edgar considers the drug almost equal to chloroform for the immediate control of puerperal convulsions. When the pulse is strong and rapid, he believes it offers the most certain means at our command for temporarily and even permanently controlling the spasms. When the pulse is weak, he uses morphin hypodermically, chloroform inhalations, and chloral by the rectum, with stimulation, if necessary. He employs 10 to 20 minims of the fluid extract, or half that quantity of Norwood's tincture subcutaneously, every 20 minutes or half hour until the pulse continues at less than 60 to the minute. The patient should be kept recumbent during this treatment. R. C. Norris employed veratrum viride successfully when bleeding was indicated, and considers it second only to free purgation with salines. He believes that the hypodermic injection of 20 minims of the fluid extract, as frequently advised, is too great an initial dose. He employs 8 minims of the fluid extract, and repeats the administration in 5-minim doses sufficiently often to keep the pulse-rate between 70 and 80. B. C. Hirst has great confidence in the efficacy of veratrum viride in puerperal eclampsia, and uses 20 minims of the fluid extract hypodermically as a beginning dose. He

employs it only in sthenic cases. E. P. Davis obtains the best results with the drug in the treatment of eclampsia by the hypodermic injection of 10 drops of the tincture every hour until the pulse falls below 90, and its tension is decidedly lessened. No unfavorable result has been observed during or after its use. G. M. Boyd believes that the use of *veratrum viride* in eclampsia is of very doubtful value. He employed it to its full physiologic effect with no resultant improvement in the patient's condition. W. R. Wilson places no dependence upon the drug in this condition, believing that eclampsia can be treated best by the establishment of prompt elimination. J. Whitridge Williams is of the opinion that other measures are more rational in the treatment of this disease. E. Reynolds has no faith in the virtues of *veratrum viride* in the treatment of eclampsia.

Cesarean Section for Eclampsia.—Sippel¹ discusses the question of cesarean section for eclampsia. Recognizing virulent toxemia to be the cause of eclampsia, he draws attention to the apparent coincidence between the cessation of pregnancy and the cessation of the eclamptic paroxysms. Reasoning from this, he believes rapid delivery is indicated in these cases. When the cervix is undilated and labor has not begun, he considers cesarean section indicated. He believes it to be a less irritating traumatism than incision and dilation of the cervix. He admits that many cases are unsuitable, and quotes Hillmann's statistics of 40 cases with 19 maternal recoveries; and of 41 children, 23 saved.

Contracted Pelvis.—Albert² gives his experience of the treatment of contracted pelvis. He has collected his material from his external midwifery department in Dresden, and deals with 1187 births. He generalizes the teaching by saying that a high forceps operation must never be undertaken when version is possible, and that version and immediate extraction should be practised when a reasonable chance of spontaneous delivery has been given without avail. His assistants are not allowed to use forceps (high operation) on a "movable head," and especially when there is a contraction of the pelvis. He advises that narcosis be adopted for version, and especially emphasizes the utility of the Veit-Smellie method of dealing with the aftercoming head. The assistant or nurse must apply pressure to the abdominal wall (that is, to the uterus) in a downward and backward direction, with the palm of the hand and not with the fingers. Further, he finds that the "hanging" position, after Waleher, in which the mother is placed in a dorsal position, with the thighs hyperextended and hanging over the edge of the bed or table, is particularly valuable in the stage of extraction of the aftercoming head. The membranes must be preserved intact as long as possible, and allowed to exert their influences in dilating the os. In cases in which the membranes have already ruptured, or fail to produce the necessary dilation, artificial dilators must be used, and he points out that a careful introduction of a suitable "bag" is unattended with any risk. He uses it (1) when, the membranes having

¹ Monats. f. Geburts. u. Gynäk., Bd. xiv, Heft 2, 1901

² Münch. med. Woch., April 2, 1901.

ruptured prematurely, he can retain the liquor amnii, dilate the os, and strengthen the pains, especially in primiparas; (2) when, with intact membranes, the head does not engage, on account of contracted pelvis and incompletely dilated os, and also in oblique and transverse presentations; (3) when a clear idea cannot be formed as to how the course of the case will be in cases of moderate contraction of the pelvis. He usually gives morphin in small doses ($\frac{1}{4}$ gr.) when he uses artificial dilation. In his cases version was performed 105 times; of these, 45 turnings were used with normal pelvis for the nonengagement of the head, transverse presentation, prolapse of the cord, placenta prævia, and other causes. In 60 cases there were flattened pelvis (14 cases), generally contracted pelvis (17 cases), and 15 cases of contracted pelvis in which the measurements were not recorded. The true conjugate varied between 2.7 and 3.5 inches; of the children, 9 out of 9 cases of placenta prævia died, and 2 were already dead before version was performed. This left 93 children, and 5 of them died, giving 82.8 % of living children (that is, living when the mother was discharged as "well"). Of the contracted pelvis children, 18.7 % died and 81.3 % lived. The mothers all recovered except one. In 4 cases a temporary pyrexia was recorded. In conclusion, he points out that the results might have been even better, as his assistants were often inexperienced in the operation of version, and thus may have failed to save the child in certain cases in which a more skilled practitioner could have been successful. Macnaughton Jones¹ describes Bossi's instrument for dilation of the cervix in contracted pelvis and eclampsia. The instrument (see Figs. 45 to 48) has a special curve, and its branches or blades are grooved externally so as to prevent them from slipping in the cervical canal. By an arrangement of pivots the three branches, when the wheel handle is rotated, open simultaneously to an extent of 3 cm., and the degree of separation is indicated on a quadrant. It is claimed that rapid dilation can be obtained in from 15 to 35 minutes without injuring the integrity of the cervix or causing damage to the presenting part. Schoedel² reports, from the clinic in Dresden, 41 cases of induced labor, occurring in 15,627 cases of labor, a ratio of 1 in 381. [This is a low percentage, as many writers upon the subject in other clinics give a ratio of 1 to 131 or 1 to 176.] Among the cases there were 5 of symmetrically contracted pelvis, 27 of flat rachitic pelvis, 8 of simple flat pelvis, and 1 of obliquely contracted pelvis. The smallest true conjugate for which the operation was performed was 7.5 cm. The largest true conjugate was 9.5 cm. The average period of gestation was 35 weeks and $3\frac{1}{4}$ days. The longest gestation was 37 weeks and 5 days, and the shortest 33 weeks and 2 days. The average length of the children was 47.1 cm., and the average weight 2527 grams. Especial attention was given to cases in which the induction of labor seemed necessary. During the last two months of pregnancy these patients were kept constantly under observation. They were often examined once or twice each week in the clinic or at their homes. The comparative size of the fetal head and the pelvis

¹ *Lancet*, Mar. 1, 1902.

² *Arch. f. Gynäk.*, 1901, Bd. Lxiv, Heft 1.

was carefully estimated. There were 35 vertex presentations among these cases, 4 transverse presentations, 1 breech presentation, and 1 oblique position of the head. Of the children in vertex presentation, 14 were spontaneously delivered and survived; 4 perished a few days after labor. Of those born spontaneously, 71.4 % were discharged in good condition. Of the children that perished, inspiration pneumonia was found in 1 case; subpleural and subpericardial hemorrhage, with collapse of the lung, in another; intracranial bleeding in the third from long-continued labor, and also in the fourth because of the premature

escape of the amniotic liquid. The child born in breech presentation survived. In 26 cases labor terminated by operation. Version was done 25 times and the forceps used once. Of the children born

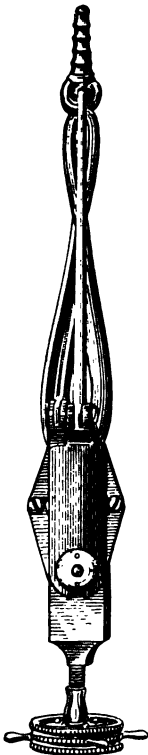


Fig. 45.—Bossi's instrument for rapid dilation of the os and cervix uteri.

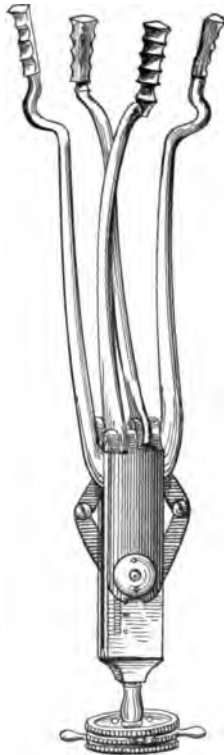


Fig. 46.—Dilator opened.



Fig. 47.—Detachable guard.



Fig. 48.—Closed end of dilator, the guards being removed. This enables the operator to dilate the cervix to a given extent when the four grooved guards can be fixed on the ends.

(H. Maenaughton Jones, in *Lancet*, Mar. 1, 1902.)

by version and extraction, 56 % were discharged in good condition, the remainder dying within 2 or 3 days after birth. While it is true that the child has the best chance for life when presented by the head, this does not obtain when labor is unduly prolonged. The effort was made in each case to secure birth with the head presenting. When this could not be done, version was made early in labor, just before the membranes ruptured or immediately afterward. The only case in which forceps were used when the head was presenting was one in which tympany of

the uterus suddenly developed after the head entered the pelvis. Both mother and child recovered in this case. In the case in which the child presented with the head obliquely across the pelvis the child perished 2 days after delivery, and an indentation of the cranium with intracranial hemorrhage was found upon autopsy. The indications for version in vertex presentations were prolapse of the cord in 4 cases, irregularity of the fetal heart in 1, and an unfavorable position of the head in 14. In 1 placenta prævia required version before dilation was complete. Craniotomy was also done in this case. In all of the 41 cases, 35 children were born living and 6 were stillborn. During the first 10 days after labor 9 of the children born living died; 63.4 % of the children were discharged from the hospital in good condition. Of the mothers, 39 of the 41 were discharged recovered; 1 perished in the clinic with acute anemia, atony of the uterus, and weakness of the heart. In the second case the husband insisted upon taking the patient to her home against the advice of the physicians. Symptoms of thrombosis were present, and the patient died of embolism before reaching the railway station. The maternal mortality in the series was 2.4 %. Three patients had continued high fever, one from pneumonia, the second from thrombosis, and the third from gonorrhea, as gonococci were found in the vaginal secretion before the induction of labor. The method of inducing labor was the introduction of the bougie, followed by the use of an elastic bag. A bougie is inserted and allowed to remain for 24 hours, when if pains do not occur, a second is inserted. During the next 24 hours the cervix usually dilates sufficiently to introduce one or two fingers. An elastic bag is then introduced, and from 250 to 500 cc. of fluid is inserted. The average duration of labor by this method was 41 hours and 1 minute.

Spontaneous Rupture of the Uterus.—[Rupture of the uterus during pregnancy or parturition is, happily, a comparatively rare occurrence.] The signs of threatened rupture are usually so clear that R. M. Murray¹ thinks that its occurrence is a reproach to the obstetrician in whose hands the case is. Under traumatic causes must be included all cases brought about by mechanical violence, such as the forcible introduction of the hand into the uterus, the unskilful performance of the version, and the improper use of forceps, etc. These may be classified as internal traumatisms. External traumatism is a term to be applied to those cases of rupture due to blows on the abdomen and to falls. Spontaneous rupture has for its immediate determining cause the contraction of the uterus. The great majority of these cases are, however, associated with some condition arising from an abnormality of either of the two factors of labors—the “passage or the passenger.” Examples of the first are found in cases of rigid os and contracted pelvis; of the latter, hydrocephalus or malpresentation. Thanks, in the main, to the classic work of Bandl, the mechanism by which the process occurs is known to all. With an obstruction to the dilation of the os the lower uterine segment becomes thinned out, while the muscular

¹ Jour. of Obstet. and Gyn., Brit. Empire, Feb., 1902.

tissue of the upper segment gathers itself together into a sort of cap on the upper pole of the uterine mass. The strain on the lower uterine segment increases until it gives way, in most cases not far from the junction of the two segments. The tear tends to run across the long uterine axis. In contracted pelvis the location of the tear is determined by the grinding of some portion between the fetal head and the pelvis. On the other hand, spontaneous rupture may occur in certain cases without any process such as that described by Bandl. There may be no abnormal obstruction to the escape of the uterine contents; the labor may only have begun, and, moreover, the tear may have no special relation to the lower uterine segment, though it may, by extension, involve it too. Three sets of cases may be found in this group, viz.: (1) Interstitial pregnancy rupturing at the fifth or sixth month, even following the first labor pain. (2) Spontaneous labor following abnormal conditions, such as bicornate uterus, myomata uteri, and a uterus which has previously been the subject of a cesarean section. (3) A small number of cases have been reported in which rupture took place at the beginning of labor in a uterus of normal conformation, and in which there was no gross complication. Cases of this sort have been reported by Ingersler, Hofmeier, and Simpson. The first two failed to show any histologic reason for the accident. Simpson's case showed signs of fatty degeneration of a marked degree. From a study of the subject of uterine rupture in his own experience and in literature, H. Peham¹ concludes that any existing scars in the sphere of the inner genitalia are a matter of much significance in subsequent labor; that not only injuries from previous labor, but also scars after operations, especially fistula operations, play a great rôle in producing uterine rupture. Krukenburg stated in 1886 that 50 % of all cesarean section scars resulted in rupture in later pregnancies. A more exact execution of the uterine suture has somewhat lessened the percentage. The more frequent ruptures after previous lacerations are explained by the unfavorable position of the scars. If a woman becomes pregnant after previous extensive uterine injuries, he would advise the induction of abortion, thus avoiding the threatening danger of second rupture and perhaps necessary extirpation of the uterus.

Inversion of the Uterus.—[The treatment of early cases is sufficiently well understood. The treatment of chronic cases, in which the cervix has contracted and involution is completed, and in which adhesions have formed within the funnel of the inverted uterus, is not so easy to determine. Constant elastic pressure may be successful if used early and faithfully; but there remain inveterate cases which demand surgical relief. Three procedures are applicable: (1) The method of Thomas, in which the abdomen is opened, the funnel dilated, and the uterus replaced; (2) the method of Küstner, which reaches the funnel through an opening from the vagina into the culdesac of Douglas; (3) vaginal amputations of the uterus.] The weight of surgical authority, according to E. W. Cushing,² seems to be against the operation of

¹ *Centralbl. f. Gynäk.*, Jan. 25, 1902. ² *Boston M. and S. Jour.*, Feb. 13, 1902.

Thomas. Although previously content with vaginal hysterectomy in these cases, Cushing decided, after reconsidering, to adopt Thomas's method in a case which came to him for treatment, for the following reasons: The method had never been tried since the introduction of the Trendelenburg position, which posture will presumably be of as much advantage in treating inversion abdominally as in performing hysterectomy. Adhesions can be separated more carefully from above. The ligaments which support the uterus will be found elongated and weakened, and ventrofixation will avert recurrence of the inversion. Less blood will be lost if all manipulations be done from above. The whole operation will be cleaner. On these *à priori* grounds Cushing treated his case by the method of Thomas, and his experience was in entire conformity with his anticipations. The position of Trendelenburg being used, Thomas's operation becomes the operation of election, being easier, safer, cleaner, and more surgical and satisfactory than any other.

Oui¹ states that the mortality of Thomas's method has been 16 $\frac{1}{2}$ %. He relates quite a list of cases—all that have been reported; but it should not be lost sight of that most all were done before abdominal operations were perfected. The amount of success so far is 58.3 %.

FETAL DYSTOCIA.

Correction of Occipitoposterior Positions.—Dickinson² says a simple method, always worthy of trial and often successful, is the seizure of the ear and the exertion of pressure or traction to turn the head. The manœuvre is available whenever the ear is within reach. Two fingers are pushed in beneath the pubic arch and the ear is caught between their tips. The middle finger being longer than the index, would be better placed against the back of the ear if the reach is a long one or the patient stout or sensitive. The index-finger, however, with its greater strength, has more pushing power when its tip lies behind the ear. But whether one finger or the other goes to the mastoid side of the ear is not material, nor



Fig. 49.—The ear, seized between the tips of two fingers, serves as a handle to rotate the head in occipitoposterior positions (Dickinson, in Amer. Med., Sept. 7, 1901.)

does it matter whether palmar or dorsal aspect of the finger is applied to the head. Palm toward pubes gives the longer reach. The cartilage of the concha furnishes a resisting projection on which pressure is exerted, or the flap of the ear gives a handle to pull upon. During a pain that

¹ New Orleans M. and S. Jour., April, 1902

² Amer. Med., Sept. 7, 1901, p. 361.

rotation which has been gained is held, and progress is resumed after the passing of the pain. It is his practice to overcorrect except when the head is on the pelvic floor, or when descent is rapid. That is, if the head is engaged, or midway in the pelvis in a right posterior position, it is turned to the left anterior, provided no undue resistance suggests excessive torsion of the neck. Then one expects the untwisting of the trunk to draw the head back to the right anteriorly. It goes without saying that flexion must be maintained or faulty flexion corrected, and also that the chin must not be swung around beyond the shoulder. In attempting the swing through the half-circle, that shoulder which is above the pubes must give assurance to the operator that the trunk is swinging with the head. The lateroprone position across the bed sometimes proves advantageous. The anterior ear offers a better purchase for rotation of the occiput forward than any other simple method, whenever it is within reach.

Deep Transverse Arrest of the Head as an Indication for Forceps.—C. B. Reed¹ thinks that the obstetricians do not pay proper attention to this position, which is of a definite character, and its frequency and pronounced effect upon labor is worthy of more especial consideration. In the last 3600 cases in the Chicago Lying-in Hospital the condition has been recognized 33 times, and doubtless there were other instances in which spontaneous rotation occurred. He summarizes as follows: Deep transverse arrest of the head is a relatively common complication in labor; the diagnosis is easily made from the position of the sagittal suture and the fontanel; the normal termination of the case cannot be waited for in most instances, but forceps should be applied as soon as it is evident that rotation will not occur spontaneously; the blades should be applied in that pelvic oblique diameter toward which the occiput lies; the location of the occiput must be determined before the blades are applied; and traction and rotation must be simultaneous.

The Dangers and Diagnosis of Breech Presentation.—Spencer² calls attention to the dangers of breech presentation to the fetus. In 26 cases in which he made an autopsy upon the fetus hemorrhage had taken place into the kidney to such an extent that had the child lived the kidneys must have been permanently damaged. This suggests the necessity for caution in making pressure upon the region of the kidneys during the delivery of the child. Hematoma of the liver and injury to the lungs may also result in these cases. Hemorrhage into the mucous membrane of the uterus may result from pressure in breech presentation, and is sometimes mistaken for menstruation in infants. In children delivered by the Prague method hemorrhage into the muscles of the neck is often seen. Damage to the brachial plexus and injuries to the bones and joints are sometimes observed. In diagnosing breech presentation the bladder and bowels of the patient should be emptied. She should lie upon her back along the edge of the couch or bed with the shoulders and head somewhat raised. Auscultation is especially

¹ Chicago Med. Recorder, May 15, 1902. ² Brit. Med. Jour., May 18, 1901.

valuable in these cases, as the heart-sounds are heard higher than in vertex presentations. By palpation the head is not found in the lower uterine segment, but can be detected at the other extremity of the uterus, and can be readily shaken (Fig. 50, A). In one form of monstrosity, anencephalic fetus, palpation fails to reveal the diagnosis. In this instance the fetal head is no larger than the breech. The diagnosis having been made, Spencer urges that external version be performed (Fig. 50, B). It is rare that an anesthetic is required, and usually the fetus can be turned with little difficulty. An abdominal belt may be worn to prevent the recurrence of the abnormal presentation. One-fifth of such cases occur in multiple pregnancies, with a mortality of 12.7 %. The operation of external version should not be attempted in a considerably flattened pelvis when the fetus is dead, the uterus

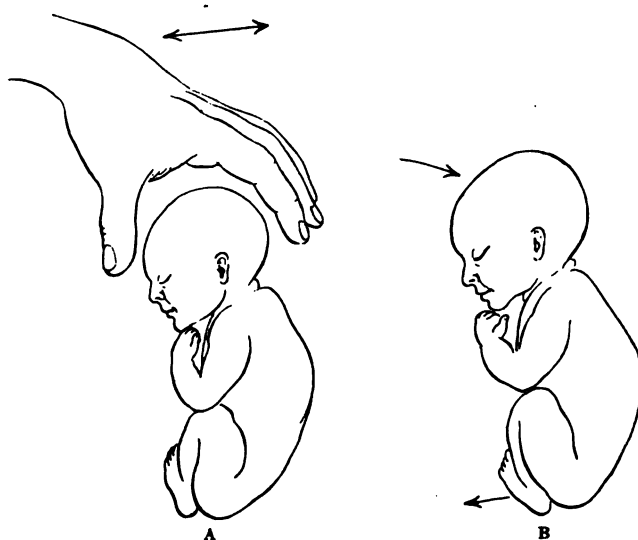


Fig. 50.—A, Shaking the head in the diagnosis of breech presentation. B, Direction of the forces in external version for breech presentation. The upper arrow shows the direction of the push of the left hand on the head (in the direction of the curve of the spine); the lower arrow shows the direction of the pull of the right hand on the breech (Spencer, in *Brit. Med. Jour.*, May 18, 1901).

malformed, or placenta prævia is present. The operation may fail if the cord has been wound about the child's neck or if fibroid tumors of the uterus are present. Ordinarily, however, it does not offer especial difficulty.

A New Symptom in the Diagnosis of Dystocia Due to a Short Umbilical Cord.—S. M. Brickner,¹ after a careful study of 2 cases, the details of which are given, believes that he has observed a symptom which is significant of this condition and of no other, and which is logically explicable on anatomic and physiologic grounds. This symptom consists in the frequent jerky discharge of urine in the intervals of the pains of the second stage—an act which is repeated as soon as the pain

¹ *Am. Jour. Obstet.*, April, 1902.

dies out, and is kept up until the fetal head reaches the vulva. This is readily explained. In the second stage of labor, by the advances of the fetal head, the bladder is tightly compressed against the symphysis, and the urethra is compressed and elongated, making either spontaneous urination or catheterization impossible. If the head recedes from its position, as it usually does, in both varieties of short cord, this compression ceases, and there is a sudden expulsion of urine. This intermittent urination continues until the head reaches the vulva, or in a position so low in the genital tract that the retraction efforts of the cord are no longer able to dislodge it. It is now generally agreed that 10 inches is the minimum length of a cord which will allow labor to go on to its natural termination without accident; and Brickner gives the chief diagnostic points in the order of their importance as follows: Recession of the head in the intervals of pain; urination in small quantities in the intervals of pain after the establishment of the second stage; arterial bleeding during and between the uterine contractions; pain over the placental site, especially during a uterine contraction or during the application of the forceps; a desire of the patient to sit up; uterine inertia.

The Unequal Growth of Twins.—Bendix¹ discusses the problem presented to any one who watches the unequal development of twin children under equal dietetic measures and an exactly similar environment. Twins are thus convenient subjects for demonstrating the individual element in the process of growth. A perfect diet according to general principles does not necessarily produce ideal development. Some infants seem to assimilate and thrive upon the most fearful and wonderful methods of feeding, such as coffee and bread, or milk far too diluted and continued for months together. Others waste though receiving food which theory and experience teach is that most suitable to their age and condition. The development of the child depends, indeed, upon something more than the quantity and quality of its food; that is, upon its natural vitality, or, in other words, its constitution. Success in rearing delicate children depends upon recognizing the individual capacities of the child, and not blindly limiting one's procedure to those measures successful in ordinary cases. The constitution of a child depends upon the efficiency of its digestive organs, upon the natural vigor of its cell life, and the perfection of metabolism in its whole organism. These functions are further dependent upon the degree of efficiency of the circulation and respiration, upon the amount of muscular exercise, and the influence of light, air, and temperature. Besides these there are, no doubt, other forces at work which cannot be estimated in our calculations on account of their unknown and impalpable nature. Bearing in mind these elements of the constitution when a rational diet adapted to the age fails in one or two twins, every endeavor must be made to discover which is the weak spot in the organism, even to the extent of experimenting on the state of its metabolism. But it usually comes to the trying of various food-mixtures in succession. Some

¹ *Jahrb. f. Kinderheilk.*, Dec., 1901.

cases will thrive on a food poor in fat but rich in sugar, while others require an excess of fat and reduction of albumin. In yet others the indications are more complicated and hard to find; such cases will be more amenable to treatment after the further development of the science of dietetics. The reflections of the writer were based on his close observation of 11 pairs of twins. Charts and diagrams are furnished to compare their differences in growth. Only two sets grew up with equal weights; in the other 9 one child was more or less left behind the other. Although twins are at birth below the average weight, they soon make up the deficiency if they are healthy. The initial weight of the two was usually nearly equal; the sex was similar in 9 out of 11 cases, and was female in 7.

Triplets.—[Multiple births among mankind are, after all, not by any means uncommon, and any contribution which seeks to explain their causes is of scientific interest.] Such is presented by R. Sauter.¹ He gives the following data: Out of 70,477 births, 30 cases of triplets alone have been noticed. This is too large a number, but is due to the fact that at the institution in which the statistics were gathered a very large number of the women are primiparas. This would make the average one set of triplets in every 2349 births, which is certainly not the truth. Another reason perhaps for the large number is that in multiple births a physician is often on hand and the case is suitably recorded. The revised and modern statistics from all possible sources make their occurrence practically 1 in 8000 births. Quadruple births seem to occur once in 371,126 cases, and twins once in 89. The age of the mother is a factor in these cases. In twins the greater number give birth to them between the twenty-fifth and the thirty-fourth year, while in triplets the range is from the thirtieth to the thirty-ninth year. The number of previous pregnancies in the same mother always appears to have an influence. There is no doubt that multiparas show the greatest tendencies toward triplets, and the greater number of children a woman has had, the greater is her chance of having either twins or triplets. The revised and modern statistics show, further, that as a rule triplets occur among the youngest children of very large families on the average oftener than do twins. The character of the previous pregnancies is also a factor in the case. The individual disposition of some women to twin pregnancies is already accepted, and indeed to multiple births also. Meribcau has found 17 cases in which 3, 4, 5, or even more children were born at the same time. Sauter himself has seen 3 mothers of triplets who had previously had twins once, one mother who had twins once and triplets once previously, and another who had twins twice and triplets once previously. There are other conditions connected with the pregnancies which are along the line of abnormalities. Many women who have had triplets give a history of many miscarriages and abortions. The author has seen 8 cases with 1 abortion, 2 with 1 miscarriage at 7 months, others with 2, 4, and 3 abortions respectively, and the last added 2 miscarriages in addi-

¹ Zeitschr. f. Geburt. u. Gyn., Bd. XLVI, Heft 3, 1902.

tion. Heredity is another matter to be remembered. It holds as well for triplets as for twins. He has seen one case in which the mother herself was a twin; in another brothers and sisters were twins, and in the third the mother had had 12 single and 2 twin children. The duration and course of the pregnancies are also important. The rule seems to be that the majority of threefold conceptions are not carried to term, but are ended in the second half of the eighth month. A great many of these patients are lost before the pregnancy is half over. The nature of the delivery itself is important to remember. The average length is 12 hours, as in single or double births. The interval between the appearance of the children may be very short or very long. The average is about half an hour, but such intervals as 4, 6, 9½, and 12½ hours have been noticed. There is at the present time, however, no record in which the delay between the births of the children has been a matter of days or even weeks, as is sometimes seen with twins, making such pass into the category of superfetation. Childbed is, as a rule, normal and favorable. The prognosis for threefold conception is as good as for single conception, with the sole exception that eclampsia is the chief danger. The children are necessarily much smaller than in twins or in single births. The records show that in 768 cases all were boys 409 times, and all were girls 359 times. When the sex was mixed in a total of 921 cases, two boys and one girl occurred 504 times and two girls and one boy 420 times. The formation of the placenta is the latest point of interest. It seems as if the rule were that the after-birth is divided into two sections most frequently. Next it occurs as one large mass, and least frequently there are 3 separate after-births. Triplets produced from one ovum, as is shown by the occurrence of one chorion, have been recorded only twice. The children therefore had one placenta and were all of one sex. Triplets produced by two ova have been recorded 14 times. Such would have usually 2, never 3, placentas. Triplets produced by 3 ova, in which each had its own chorion, have been found but 9 times. In this case, of course, the children had each its own placenta, but 6 of the cases had two placentas. The essential cause of such threefold conception is not known, and probably never will be.

OBSTETRIC OPERATIONS.

High Retraction Ring as a Contraindication to Version.—R. W. Holmes¹ read a paper on this subject before the Chicago Medical Society, February 5, 1902. He said that the retraction ring as a product of normal and abnormal labor is not given proper recognition in American text-books; it is considered so unimportant that hardly a paragraph is given to the discussion of the ring, threatened rupture, etc., and its contraindication to version. The reports of 2 cases are given, occurring in a European clinic, in which version was done with a high retraction ring at the umbilicus; in one case death resulted from rupture of the uterus; the other patient fortunately escaped. In the nonpuerperal

¹ Med. News, Feb., 1902.

uterus, and probably up to the moment of labor, the division of the uterus into body and cervix obtains. In labor, however, such is not tenable—here the upper and lower uterine segments are the divisions of the uterus, the former being made up of a part of the uterine body, the latter made up of the cervix and that part of the body between the os internum and the retraction ring plus the cervix. Three anatomic factors in late pregnancy may often denote the potential (proximate) site of the future ring: the vein of Bayer, the “line of firm peritoneal adhesion,”—i. e., the peritoneum of the uterovesical fold passes onto the uterus near the os internum, is loosely attached to the lower uterine segment, and becomes closely adherent near the future site of the ring,—and the densely woven structure of the muscle of the upper segment and laminated structure of the lower segment with a considerable excess of connective tissue. The muscular arrangement of the two segments is more evident in advanced labor, and the segments are separated by a distinct rim or ledge—the retraction ring. In every normal labor one should attempt to find the retraction ring. With a slight rise in normal labor it may be difficult or impossible to discover it; but the more one looks for the ring late in normal labor, the more likely will one be to find it under physiologic conditions and the more positively one will make it out in pathologic circumstances. When some obstruction exists, the ring will be 2 or more inches above the pubes—the higher it rises, the more probably will these symptoms be present: First, increased sensitiveness of the lower segment, gradually becoming more marked until actual pain is present in the contraction and also in the intervals of uterine activity; palpation will bring out this pain. The round ligaments will be large, tender, and much stretched. The ring will be felt as a distinct groove running obliquely across the uterus (abdomen)—as the ring rises in spare women it may be clearly seen. The fetus may be more clearly outlined in the interval of contractions through the much attenuated lower segment. Examining internally, we may find the thin segment bounded at its upper border by a distinct ledge. With these findings, the pulse will be more frequent, temperature raised, and in extreme cases we may have the woman complaining of the impending evil. In a goodly proportion of cases the membranes will have been ruptured for some time. The ring must be differentiated from a full bladder, the sulcus formed by the depressions of the neck being filled by the uterine constrictions, the lower border of the placenta, and large fibroids of the anterior wall, and in certain cases of twin pregnancies. Each of these will be excluded by a careful consideration of the characteristics peculiar to the several conditions. At the beginning of the labor the potential site of the ring is behind the pubes. As labor progresses the upper segment contracts and retracts; the lower segment dilates and stretches. In the course of normal labor retraction occurs in almost the same ratio as the child is expelled from the uterus, so the lower segment is only slightly stretched—that is, the ring mounts usually not more than 2 inches. In obstructed labor retraction of the upper segment goes on more rapidly than expulsion, or expulsion may

be impossible from insuperable obstruction; here as retraction of the upper segment diminishes that part of the uterine cavity made up by it, there must be a compensatory stretching of the lower segment to give the fetus a uterine covering; this thinning permits the ring to mount to the umbilicus or even above it; the higher the rise of the ring, the more imminent is rupture of the uterus. With a certain dogmatism one may state that the higher the ring rises with the resultant thinning of the lower segment, the more strictly must one draw one's lines against performing version. Mere elevation of the ring alone cannot be solely one's criterion—one must consider the general condition of the uterus at the moment of the tentative attempt. A high ring with intact membranes at the moment of the operation will offer better results than a lower ring with membranes ruptured for a protracted period. When in doubt of the advisability of performing version, prepare for the operation; pass the hand into the lower segment—if the fetus is tightly grasped by the uterus, if the segment is very thin and the ring high, alter the plans and try tentatively the axis-traction forceps. If they fail after 10 (?) tractions, remove the instrument and perform craniotomy. If the child be dead, perform craniotomy as the operation of election. Do not perform version on a dead infant long after the membranes are ruptured. In transverse cases perform decapitation or embryotomy as the case indicates. Decide each case on its merits and give the mother the most certain procedure; the infant is usually dying or dead, so should have little consideration beside the welfare of the mother.

Symphyseotomy with Drainage of the Prevesical Space.—P. Zweifel¹ admits that in Germany the operation of symphyseotomy does not belong to the order of the day; but he thinks the opposition to it is based upon dangers which may be avoided. He reviews the conditions of the wound after this operation: the separated cartilage, which readily reunites; the incision in front of the symphysis, which presents no difficulty in treatment; and the prevesical space lying back of the symphysis, the tissues of which, filled with vessels, may become the receptacle of oozing blood and wound secretions and the source of fever and infection. Hence this space should be drained, not with gauze, which may not drain at all, but with drainage-tubes, usually through the vagina. If for any reason this is not practicable, then the drainage may be through the major labium pudendi. When one sees the amount of wound secretion thus carried off from the preperitoneal cavity, it is clear why its stagnation may cause fever and a prolonged and endangered convalescence. Zweifel from his experience is convinced that the important point in the treatment after symphyseotomy is the drainage of the preperitoneal cavity; and that the high application of the forceps in those cases in which the head will not engage entails so many evils that symphyseotomy is to be preferred. From experiments on 28 female cadavers taken at random, A. C. Sanderstein²

¹ Centralbl. f. Gyn., Mar. 29, 1902.

² Jour. of Obstet. and Gyn., Brit. Empire, Mar., 1902.

finds that 6 cm. of separation is all that can be allowed, and this increases the true conjugate only 1 cm. ($\frac{1}{2}$ inch); therefore the operation is useless if the true conjugate is less than 7 cm. The child, of course, must be living. Walcher's position is necessary to get the above increase. Sometimes there is a tendency to unequal movement on the two sides of the pelvis, and this must be counteracted, as it may cause injury to the ligaments or viscera. The knife should have a broad blade, and the symphysis must be completely divided; but if the subpubic ligament be left, it prevents tearing down into the vulva. Ossification of the cartilage does not occur—at least, was not found even in subjects over 70 years of age. Sometimes the joint, not being in the middle line, is missed and the bone cut, and this often results in necrosis. Localized septic infection and death from sepsis have resulted so often that extremely rigid asepsis must be carried out, and a previous foul vaginal discharge is a contraindication to the operation. A series of 13 successful operations is reported by E. A. Ayers.¹ He performed it on 11 individuals, repeating the operation in subsequent pregnancies on 2 women, and doing it 3 times in 1 case. Infection of the joint did not occur and no death was directly caused by the operation. Three children were lost and 11 saved. Firm fibrous union of the pubes was secured in all cases but one. Each patient was kept in bed 4 weeks. He protests against cesarean section as the method of choice, and claims that the true mortality after symphyseotomy can be had only after subtracting that due to all preceding efforts at delivery. Properly, the operator should select only that method which gives the best results, not in general, but in his hands. He considers the sources of prejudice against symphyseotomy as follows: (1) Wounds about the vulva can be rendered absolutely aseptic and need only remain open until the joint is severed. The approximation of the wound edges by bringing the knees together obviates the necessity for stitches. (2) The subcutaneous method of dividing the joint also reduces the danger of infection. (3) Hemorrhage can be largely avoided if the scalpel be passed along the face of the pubes instead of below it and thus wounding the bulbus vestibuli, or above it and entering the peritoneal cavity. (4) Perisymphysial lacerations during delivery occasion the greatest anxiety. The relations between pelvic inlet and fetal head should always be first ascertained in order to determine whether a pubic separation of 2½ inches will insure delivery. Full antepartum dilation of the cervix must also be secured, and when forceps are applied to the head the cervix and bladder should be pressed back while the forceps bring the head not so much through the brim as through the cervix. As the separation of the pubes alters the normal mechanism, anterior rotation of the head should be assisted by the forceps. (5) Care in handling both before and after operation will prevent injuries to the sacroiliac joints or cause failure of joint union. The author submits certain requirements as necessary to secure the surest and best results: (a) Constant apposition of the pubic bones with even coaptation, but without

¹ Jour. Am. Med. Assoc., Mar. 8, 1902.

compression. (b) Ability of the patient to empty bowels and bladder without disturbance of the pubic joint. (c) Freedom of restraint of the body above the pelvis and of the limbs whereby lactation can be performed. (d) Avoidance of bedsores.

A Substitute for Symphyseotomy.—A. Morkowitin,¹ of the surgical clinic of the University of Tomsk, Siberia, proposes, in a communication recently forwarded to England, to substitute for symphyseotomy section of the os pubis itself. The older operation has, he urges, two disadvantages. Hemorrhage is sometimes severe from injury to the venous plexuses near the symphysis, and lameness is a frequent result of symphyseotomy. Morkowitin performed his new operation on the dead body. The parts having been shaved and made aseptic, the subject was placed in the lithotomy position. A horizontal incision 2 inches in length is made through the skin along the upper border of the pubes, presumably on the left side, beginning at the symphysis and passing outward. A second incision is then made, beginning at the middle point of the first and passing downward for about 2 inches along the outer border of the labium majus. A double flap is thus formed which is dissected up on each side so as to lay bare the os pubis. The rest of the operation is performed after the usual methods in bone surgery. The periosteum is detached anteriorly, but not quite up to the symphysis, so as to spare the articulation and the muscular attachments in its vicinity. Then the periosteum on the posterior aspect of the os pubis is detached, as in resection of a rib. The bone is then divided with a chain-saw. This completes the operation. The abundant connective tissue allows of a free separation of the sawed ends of the bone, and there is no fear of damaging the venous plexuses, which are in jeopardy when the symphysis is cut through. The skin wound is united with sutures after delivery, and a drain is inserted in its lower angle if there be any doubt about asepticity. The articulation is not spoilt, and the subperiosteal division of the bone allows of a good callus. Morkowitin goes so far as to say that in an emergency the operation can be done quickly under local anesthesia by cocaine. [We have not yet heard of this operation being performed on the live subject. It would appear to be open to all the disadvantages of the direct method of symphyseotomy.]

Cesarean Section.—Williams² recently read a paper on the "Indications for Cesarean Section as Furnished by Pelvic Contractions." In 2123 cases in the Obstetrical Department of the Johns Hopkins Hospital, 278 (13.1 %) had contracted pelves. The pelves were measured both externally and internally, and designated as contracted when the conjugata vera was 10 cm. or less in generally contracted, and 9.5 cm. or less in flat pelves. Of the patients, 941 were white and 1182 black. Contracted pelves occurred in 6.91 % of the former, and 18.1 % of the latter. That is, in every fourteenth white and every sixth black woman. Of the 278 cases, 199 ended spontaneously (71.58 %). The number of spontaneous labors decreased with the increase in the pelvic

¹ Brit. Med. Jour., Jan. 4, 1902.

² Med. News, June 22, 1901.

contraction. In view of the markedly improved results following cesarean section, the indications for its performance should be widened. Thus we find that Zweifel, Olshausen, Reynolds, Bar, Charles, and Cragin have performed 162 operations with 5 deaths, a mortality of 3 %. Williams therefore believes that in uninfected cases the upper limit for the absolute indication for cesarean section should be advanced from 5.5 cm. to 7 cm., and the relative indication from 7 or 7.5 to 8.5 flat, and 9 cm. for generally contracted pelves. With the absolute indication the operation should be done either at the end of pregnancy or the onset of labor; but when the relative indication is present, the woman should be allowed to go into the second stage of labor and have bearing-down pains for one hour, when, if the head does not show signs of molding or descending, cesarean section should be performed, instead of employing forceps upon the movable head or version. So that at the present cesarean section for the relative indication should compete with high forceps or version, instead of with craniotomy upon the living child, as in the past. On the other hand, if the patient be infected, or her surroundings such that an aseptic operation cannot be performed, high forceps or version should be attempted, followed by craniotomy in case one fails to deliver the child by their means, and cesarean section reserved for those cases in which an absolute indication is present on the part of the pelvis. The cause of death in the cesarean operation is often from septicemia, infection occurring from the vagina and cervix, not through the abdominal wound. The former should be carefully swabbed with antiseptics. Results after strict antisepsis permit obstetricians to recommend that operation with great confidence. Kerr¹ believes we are hardly ever justified in destroying a living child in cases of deformed pelvis. Sterilization of the woman should not be the routine practice. It is not necessary to postpone operation until labor begins. It is more convenient to fix the time for operation beforehand, and it is of importance that the lower segment has not developed, and the actively contractile portion has not retracted, consequently one can open into the uterus through the latter part more easily, and with a lower incision.

Living Embryotomy.—[Destruction of the fetus after its death is usual enough under well-known circumstances. Occasionally, however, the child's life must be sacrificed in the interests of the mother.] G. Zander² gives the following as the usual indications: A narrow pelvis causing deviations of the head of the child or danger of rupture of the bladder; extensive plastic operations in the vagina resulting in high-grade scar-tissues, and narrowing of its lumen; unusually severe labor pains which drive one shoulder instead of the head deep into the vagina; excessive tonic contraction of the lower uterine segment in badly nourished and muscularly weak women, resulting in a very little progress toward delivery, although the uterine muscles may be intensely active; the certainty or likelihood from other signs that after a few more pains or a further delay the child will die and the mother probably suffer;

¹ Scottish M. and S. Jour., Nov., 1901.

² Centrallbl. f. Gyn., 1902, No. 14.

the open question of prognosis for the mother after a cesarean section, which may or may not save the child and is far more likely to destroy the mother. In all these cases Zander claims embryotomy is the only rational interference. Practically, all of its various methods are reducible to separation of the head or its equivalent. Fritsch and Mermann alone recommend another procedure. Turning their attention to the other pole of the child, Fritsch divides completely the rump with Siebold's shears, while Mermann does a complete evisceration, finding that after it the extraction of the child is very easy. In all cases in which embryotomy is necessary there exists a very narrow pelvis, with the child arrested high up in the canal, or an abnormal transverse position with the infant low down in the vagina. Under either circumstance

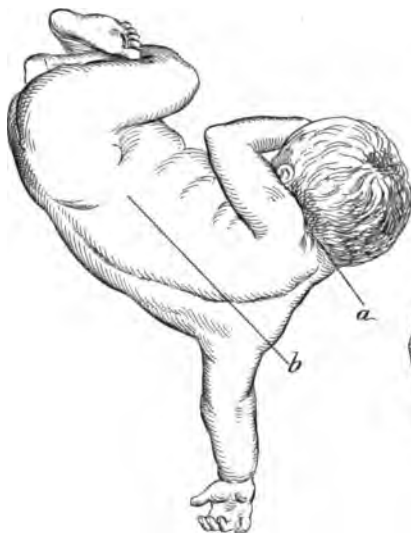


Fig. 51.—Presentation of the right shoulder, back anterior; *a*, Line of section for the classic cervical embryotomy; *b*, line of section in *embryotomie à lambeau* (Gourdets, in *Gaz. Hebd. de Méd. et de Chir.*, July 7, 1901).

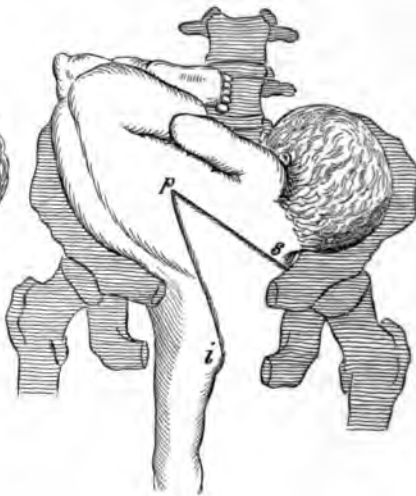


Fig. 52.—Section *b* having been made, the two lips form a V. The superior spinal flap tends to rise toward the left iliac fossa. Traction on the arm makes more complete engagement of the shoulder and draws down the lower portion of the fetus, which folds in two at *p*, causing the lower extremities and pelvis to come in contact with the head (Gourdets, in *Gaz. Hebd. de Méd. et de Chir.*, July 7, 1901).

evisceration is technically not difficult, and possible within a few minutes. With Siebold's shears one or two ribs are divided, the finger inserted, and the incision enlarged according to the indications. After this all the organs of the chest and abdomen are quickly removed. The amount of space which is gained is amazing. The next step consists in one or more of the following details: "With the body doubled upon itself, the delivery is completed by slight traction with the fingers. The hand is introduced into the abdomen of the child in order to bring down the pelvis; a foot may be delivered if easily within reach, but has as little warrant as it would have after the perforation of the head; decapitation is sometimes necessary with Braun's hook, and will be found

far more easy after than before evisceration; the spinal column may be divided, according to Fritsch, and the infant delivered in halves.

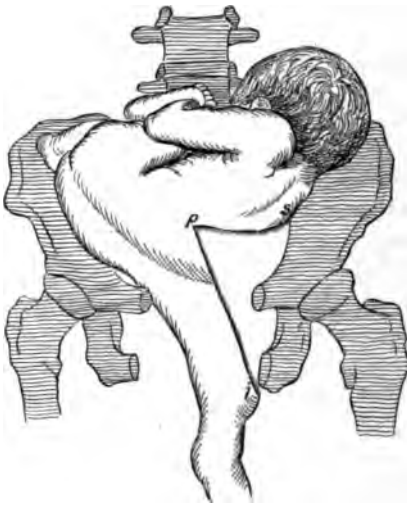


Fig. 53.—The trunk *s* rises more and more toward the left iliac fossa, while the incision in the fetus fills with the viscera, and the lumbar region, then the pelvis of the fetus, follows the mechanism of spontaneous evolution (Gourdet, in *Gaz. Hebd. de Méd. et de Chir.*, July 7, 1901).



Fig. 54.—The superior flap resting in place, the inferior flap (*i*) passed beyond it, fills the gap, aided by manual or instrumental traction (Gourdet, in *Gaz. Hebd. de Méd. et de Chir.*, July 7, 1901).

The selection of any of these special procedures rests upon technical ease and the interests of the mother, and varies with individual cases. If after evisceration space be still lacking, it is probably because the operation has not been done thoroughly. All operators complain of the technical difficulty of decapitation unless evisceration is done first. It must, finally, be remembered that this terrible destruction of the child rests entirely upon the question whether or not it will die in a short time, or whether or not by delay the chances of the mother progressively decrease.

J. Gourdet¹ describes a method of embryotomy by means of the excision of a wedge-shaped piece of the fetal body including one shoulder and a portion of the

¹ *Gaz. Hebd. de Méd. et de Chir.*, July 7, 1901.



Fig. 55.—The posterior portion of the fetus is delivered and hangs beyond the vulva. The termination of the delivery consists in extraction of the head according to the usual methods (Gourdet, in *Gaz. Hebd. de Méd. et de Chir.*, July 7, 1901).

back (*embryotomie à lambeau*). The delivery is then accomplished as in the rare processes of spontaneous evolution. The accompanying illustrations (Figs. 51 to 55) show the operation clearly.

PATHOLOGY OF THE PUERPERIUM.

Puerperal Sepsis.—Every case of fever during the puerperium should be regarded as septic, writes J. F. Moran,¹ until this is positively excluded by a most careful and painstaking examination. Other conditions with fever which are sometimes overlooked are phthisis, malaria, typhoid, influenza, pneumonia, and the exanthems. Any genital indication should be followed up by a thorough bimanual and specular examination, and, if possible, by bacteriologic and microscopic examination. One of the most common causes of fever is intestinal toxemia. Following labor there is a semiparesis of the bowel favoring fermentation and decomposition therein, and the fever subsides after catharsis. Besides the usual symptoms of fever, rapid pulse, abdominal pain, either spontaneous or provoked by palpation, changes in the lochia, etc., as indicative of sepsis, P. Budin² recommends a digital examination of the interior of the uterus. In the normal uterus a few days after labor the internal os is firm and is penetrated with a certain effort. If, however, the uterine mucosa is diseased, it seems as if the muscle-fiber were paralyzed, for one's finger is easily inserted into the cavity. One may also find there debris of clots, membranes, or placenta, which gives the finger a fetid odor. If the uterus contains only clots more or less odorous, and the uterine mucosa is smooth except at the placental site, intra-uterine antiseptic injections will suffice. If the finger detects placenta or membranes, or if at the placental site pressure suffices to detach friable pieces, one should perform digital curettage, followed by sponging. This curettage must be thorough, the bladder and rectum being emptied, and the abdominal wall relaxed under anesthesia. One or more fingers are inserted into the uterus, the outside hand holding the fundus, and the walls are scraped clean. Then an intrauterine injection of mercuric chlorid, 1 to 4000, is given, and one or two sponges, plunged in creasote-glycerin, 1 to 5, are inserted. [This portion of the treatment we would omit.] Following this a vaginal douche prevents the caustic effect of the creasote on the vagina. If there is a noticeably bloody discharge, one or two tapes of iodoform gauze are introduced into the uterus for drainage. If the infection has lasted some time before this cleansing, the cure will be slow; and if the system is seriously invaded, active supporting treatment will also be necessary.

Budin³ dwells on the frequency of irregular and localized edema appearing on different parts of the body some time after the advent of puerperal sepsis. Most important about this condition is its frequency in the lower extremities, and then it may be taken for phlegmasia dolens, though there is no plugging of the veins nor

¹ Am. Jour. of Obstet., Feb., 1902.

² L'Obstétrique, July 15, 1901.

³ Bull. de la Soc. d'Obstet. de Paris, Jan. 16, 1901.

deep general edema of the lower extremity. Budin describes a case in which rigors occurred on the fourth day of the puerperium, and the curet was used. In 3 weeks the right foot became edematous, and then the right thigh; the swelling disappeared from the right lower extremity in a very irregular manner. On the fourth week the left foot became swollen; by a week later both of the feet as well as the thighs were free from swelling, and the patient soon recovered. Perret related in 1901 a case in which edema of the lower extremities began just one calendar month after delivery, in which septic infection had occurred. The edema disappeared in a few days. As in Budin's case, there was no pain such as is seen in phlegmasia dolens.

Treatment of Puerperal Sepsis.—Wernitz¹ advocates the use of rectal injection of salt solution in the treatment of sepsis, but thinks the manner of the injection is very important. The fluid should be introduced gently, gradually, and continuously. The first effect is to empty the rectum and cause free escape of gas, to the great relief of the patient. This is followed by the absorption of the fluid, which is, after all, the chief object in view. The procedure being continued an hour, about 0.5 to 1 liter of the fluid will be absorbed. This should be repeated at hourly intervals until it increases the secretion of urine, relieves the thirst, induces free perspiration, and reduces the temperature; but care must be taken that the process does not lead to any symptoms of shivering, nor weakening of the patient, with consequent collapse. He reports using this treatment successfully in 4 cases: (1) Acute sepsis after normal delivery of a primipara; (2) acute peritonitis in consequence of a salpingitic process; (3) and (4) septic abortion with threatening symptoms and local infection. Woyer,² in his experience, obtained excellent results from the use of itrol (argentum citricum) and collargolum, the so-called soluble silver, in the treatment of uterine gonorrhea, suppurating urethritis, and fistula. After cleansing the vagina and cervical canal with itrol solution, sticks of itrol (itrol 2.5, white wax 1.5, cocoa-butter 9.0, for 30 sticks 3.4 cm. in length) are introduced into the cervix and kept in position by tampons. This treatment brought rapid cure of uterine gonorrhea and suppurating urethritis. Woyer also reports 3 cases of puerperal sepsis successfully treated with Crèdè's ointment. When other remedies had failed, he resorted to this, in the first case making 5 applications in the space of 10 hours, the rubbing upon the inner surface of the thigh, the upper arm, and the thorax continuing about half an hour each time, the parts having been previously carefully disinfected with warm water, soap, and alcohol. He began the use of the ointment in much doubt, and was greatly surprised at the rapid improvement, the fall in temperature, the slower pulse, and final complete recovery of the patient. In the third case, in addition to the ointment, because of the offensive uterine discharge, capsules of argentum colloidal were introduced by means of hydrophile gauze strips into the uterine cavity and allowed to remain 48 hours. In the cases reported the improvement and recovery followed so

¹ Centralbl. f. Gynäk., Feb. 8, 1902.

² Münch. med. Woch., Oct. 15, 1901.

closely and rapidly upon the use of Crèdè's medication that Woyer was convinced of its efficacy, and hopes to incite his colleagues to make similar experiments. [There have been some indications lately of a disposition to return to the use of quinin in a number of conditions in which its employment has been superseded, and puerperal fever seems to be among those conditions.] Aufrecht¹ advises that in every case of puerperal endometritis the uterine cavity be irrigated with a solution of carbolic acid, and then quinin administered subcutaneously. The irrigation is effected through a glass tube as large as the little finger, provided with two small openings and deeply grooved longitudinally on the outside. The solution, of the strength of 2.5 %, should be from 82° to 86° F. in temperature, to prevent collapse. The injections of quinin are generally to be given once a day for three consecutive days. One part of quinin hydrochlorid is dissolved in 34 parts of warm water, and a portion of the solution containing 7½ grains of quinin is injected into the side of the abdominal wall.

Puerperal Insanity.—Robert Jones² reports the results of a thorough study of the cases of puerperal insanity admitted to the London County Asylum. Out of 3500 female patients admitted, in 259, or 7.4 %, the insanity was ascribed to pregnancy, confinement, the puerperal state, or to lactation. Jones divides this disease into 3 classes: Insanity of pregnancy, of the puerperium, and of lactation, of which the second presents marked delirium with religious or erotic features. The first two classes occur most frequently between the ages of 25 and 29, while the insanity of lactation occurs usually between 30 and 34, a fact which supports the view that this form is closely allied to exhaustion. Of the 259 cases, 56, or 21.6 %, were from pregnancy; 120, or 46.33 %, occurred during the puerperium; and 83, or 32.43 %, were associated with lactation. Jones, in concluding his article upon puerperal insanity, discusses the prognosis, pathology, and treatment of the three types. The death-rate was highest among the insanities of pregnancy, and least among the puerperal cases. In his total of 259 cases there was a recovery rate of 63 %, and a death-rate of 15 %, divided as follows: In the insanity of pregnancy 48 % recovered, and 21 % died; in insanity of the puerperium 73 % recovered and 10 % died; in insanity of lactation 60 % recovered and 16 % died. The general treatment of the first type is that of the parturient woman—a light dietary, gentle exercise, bright surroundings, attention to the bowels by salient aperients, and the production of sleep by mild hypnotics, the best of which are chloral and bromid in combination. The insanity of the puerperium needs more specific treatment, both local and general; but the patient should generally be treated at home for at least 6 weeks. Sleep must be obtained, but opium and morphin are both unsuitable for this purpose; sulfonal and paraldehyd are satisfactory, but most so are chloral and bromid in combination. Jones has obtained little benefit from the use of either antistreptococcus serum or thyroid extract. Meyer,³

¹ Centralbl. f. Gynäk., Sept. 7, 1901.

² Brit. Med. Jour., Mar. 8, 1902.

³ Berl. klin. Woch., No. 31, 1901.

of Siemerling's clinic, publishes a contribution based on the study of 1104 cases of psychoses in female patients admitted to the psychiatric clinic at Tübingen during the years 1894 to 1901. A classification of the various forms showed that 11 were cases of melancholia, 4 of periodic melancholia, 3 of circular insanity of the maniacal melancholic form, 5 of paranoia or chronic delusions, 9 of acute mental confusion (*Verwirrtheit*), 4 of catatonia, 2 of hebephrenia, 2 of epilepsy, and 1 of hysteria. Fifty-one patients were instances of puerperal and lactational insanity. Puerperal (septic) infection was clearly established in 5 out of the 51 cases. In 5 patients mastitis was present, in 3 pulmonary phthisis was observed, and in 1 typhoid fever. A hereditary neurotic taint was present in 29 out of the 51 patients, and in the majority of the 51 patients the puerperal or lactational period was only regarded as the exciting cause. In 12 of the patients there had been previous severe mental worry and anxiety, 8 had suffered from destitution and were anemic, and the others were women with excessive and frequent confinement—for example, 1 of 15 deliveries in 23 years, after which catatonic melancholia followed. The general conclusion is that there are several forms of the puerperal psychosis, but not a single or all-comprehensive form of "puerperal insanity."

Lymphangitis of the Breast and Galactophoritis.—Maygrier¹ reports 2432 cases of labor, of which in 139 cases the breast was infected, making 5.71 % of the cases. Lymphangitis was limited in 61 cases to one breast only; in 25 both were attacked, and in 2 first one breast and then the other. The disease appeared at any time from the third to the twenty-fifth day, usually between the third and ninth. Patients were taken with inflammation of the breast who did not nurse the child as well as those who attempted to nurse their infants. In lymphangitis the attack of inflammation came on suddenly, with chill and fever which rapidly abated. In galactophoritis, or inflammation of the milk-ducts, the progress of the case was slower, the disease developed very gradually, and there was usually no chill. The disease was insidious in its development. Infection of the lymphatics rarely returned, while infection of the milk-ducts would occur frequently in the same patient. A superficial lymphangitis usually terminated by resolution. Abscess was rare in both cases with intelligent treatment. Diagnosis is made by palpation, by observing the discoloration of the breast, and by examining the milk. These cases arise in women who have fetid lochia, in overcrowded and foul wards, and who have wounds and fissures in the nipple. Of the two, lymphangitis is less severe and much shorter. The treatment consists in strict antiseptic precautions and strict asepsis in the care of the breasts. The nipples and breasts are covered with sterile gauze. Boric acid compresses are used before and after nursing. The child's mouth is cleansed with boric acid solution, and the hands of nurses and attendants are made scrupulously clean. The nipples are treated by compresses wrung out of alcohol and water, 1 to 5, or by a saturated alcoholic solution of orthoform. When the patient

¹ L'Obstétrique, July 15, 1901.

is attacked by galactophoritis, she is immediately isolated, and the child is removed from the breast. In lymphangitis the treatment consists of compresses of boric acid solution and warm applications, which are usually successful. In galactophoritis aseptic compresses are used, the milk is gently removed from the breast by expression if possible, and the abscesses are promptly opened and drained.

PHYSIOLOGY AND PATHOLOGY OF THE NEWBORN.

Birth Injuries and Nervous Sequels.—[There is a growing persuasion among specialists in nervous and mental diseases that injuries inflicted on the head of the child during the progress of difficult and protracted labor are responsible for many more of the serious nervous and mental conditions that sometimes develop in after-life than has been supposed.] A. F. Currier¹ calls renewed attention to this very important question. It has been too much the custom to think that the brain-tissues of the newborn are capable of standing with impunity much more of traumatic abuse than those of the adult. Because irregularities of the skull produced during the molding process of a protracted delivery very frequently disappear completely within a short time after birth, it has been considered justifiable to assume that the underlying soft tissues also undergo *restitutio ad integrum*, and that no serious effects need be feared. Despite this common impression to the contrary, infantile cerebral tissues are extremely delicate, and it requires but very little traumatism or even unfavorable conditions of nutrition to produce serious lasting ailments. Some years ago, when the problem of the easier delivery of children through contracted pelvis was being solved by the production of labor from 4 to 6 weeks before term, it was found that children thus prematurely delivered often failed to develop normally. Mental defects were not rare in such children, apparently because the delicate brain found normal development impossible under the unusual conditions of extrauterine life. It is evident, therefore, that we cannot presume on the unsusceptibility of these young brains to injury. Moreover, careful review of the history of cases of serious nervous disease that develops later in life shows that a difficult labor is apparently the most important element in the etiology of the condition. German authorities are coming more and more to the belief that so-called idiopathic epilepsy is really due in the majority of cases to injuries received during birth. There has not been any doubt in the minds of most physicians for many years that many of the cases of idiocy and impaired intellectual power are due to labor lesions. Two lessons are emphasized by these considerations of the possible lasting effect of injuries received during labor. The first is the rule of absolute abstention from interference with the normal course of delivery unless necessity demands it. Parturition is an eminently individual process. No general laws can be laid down for the length of time it shall last in any given case. Only the special indications

¹ Med. News, Aug. 3, 1901.

of the particular case can justify artificial aid in delivery. Pathologic conditions about the cranium, especially those which involve the bony structures, should be treated in the same manner as corresponding lesions that occur in patients at later periods of life. Bone depressions should be elevated without delay. Fractures of the skull should receive the most careful attention, so that as far as possible the occurrence of internal ridges of bone shall be avoided. Whenever labor has been difficult or protracted, a careful examination should be made very shortly after the infant's birth in order to detect any lesion that may have resulted. The realization of his duty in this matter will itself act as a deterrent on the obstetrician who might be tempted to terminate a slow labor artificially because of its time-taking protraction. The saving of even a few children from hopeless idiocy or life-long nervous affection is enough to encourage the use of every conservative means during and after parturition. Undoubtedly some of the alarming increase in nervous and mental diseases in recent years is due to a neglect of proper precautions with regard to labor and properly applied surgery after its termination. No effort in this direction should seem to be too costly, for no price is too high to pay for even a slight reduction in the number of nervous and mental conditions that may with some considerable show of reasonableness be attributed to birth injuries.

Metabolism of the Newborn.—Cramer¹ has made a series of careful experiments to determine the metabolism of the newborn child and the circumstances which influence it most profoundly. He finds that newborn children obtain from the mother but little water during the first few days of life. Unless the child is given water the secretion of urine is lessened, and gradually increases as the secretion of milk becomes established. From the tenth day on, in children well developed and well nourished, the daily quantity of urine approximates 70 % of the fluid taken. The formation of gas in the intestine in newborn children occurs at intervals of about 2 hours. Soon after birth, from feeble metabolism and reflexes, and because little water is taken, much less gas is formed than later in life. After the first 10 days of life the activity of metabolism increases and gas is formed more freely.

The Blood of the Newborn.—F. Varaldo² has made observations on the histologic and physical characters of the blood of the umbilical vein as compared with that of the umbilical arteries of the infant at the moment of birth. By a method differing a little from those previously employed by investigators, he obtained some cubic centimeters of blood from the arteries of the umbilical cord and some from the vein. He found that the blood of the vein was richer in leukocytes than that of the arteries, but there was no constant difference between the numbers of the red cells. The blood of the vein contained more hemoglobin than that of the arteries, but its density was less. Further, it was found that the leukocytes of both vein and the arteries contained an iodophilic substance (as shown by Ehrlich's reaction), and that the

¹ Arch. f. Kinderheil., 1901, Bd. xxxii, Hefte 1 u. 2.

² Archiv. di Ostet. e Ginecol., vii, 723, Dec., 1900.

leukocytes of the vein contained it in greater amount. The possible bearing of these observations upon the question of the nutrition of the fetus is that they seem to show that leukocytes coming from the placental (and from the maternal) circulation are arrested in the fetal tissues, and that consequently special substances which they contain (iodophilic granules, glycogen?) are also given to the tissues. There are other differences between the blood of the vein and of the arteries, so that we are justified in concluding that there is a dissimilarity of a complex nature. The mothers of the infants were quite healthy and the pregnancies uneventful.

Spontaneous Facial Paralysis of the Newborn.—[The majority of authorities hold that this condition is usually of traumatic origin due to the employment of forceps during parturition.] O. Macé¹ claims that there are two varieties of facial paralysis in the newborn—one due to trauma and another which is congenital. The first class results from forceps which produce pressure either directly or indirectly, from edema, blood-tumors, or compression at some portion of the pelvic canal by a tumor. Again, the force of the uterine contractions upon a head passing through a contracted pelvis may be sufficient to cause crushing of the bony canals through which the facial nerves pass out of the interior of the cranium, thereby producing permanent injury to the nerve. Or this same factor may produce cerebral hemorrhage at the point of exit for the nerve. Under the second group he places those caused by anomalies in the development of the nerves or their ganglions. Adherence of the amnion is another etiologic factor in causation. Writers have described cases in which there was atrophy of the nerve or complete absence of it on one or both sides. Congenital facial paralyses are in general unilateral. They are partial or complete and are peripheral or central. Cases of nuclear origin are most interesting. Cabannes has described both unilateral and bilateral forms. In general the prognosis in congenital facial paralysis is good. By the use of the continued electric current in some cases, and the interrupted in others, one can hope for recovery if the causation be not an arrested development. The time required is between 2 or 3 days and a month.

Comparative Weight of the Newborn.—The results found in the weights of children who are fed on the breast alone, on the breast and other foods, and on the artificial foods alone are reported by Bresset.² The experiments were carried out in 258 cases. The children were all under 1 year, and were divided into two groups—those under 6 months and those between 6 months and 1 year. One hundred and eighty-three were under observation for 3 months, and upon these the author bases conclusions. Of those fed at the breast, 51 % to 65 % were above, the average; 42 % to 56 % of those fed on a mixed diet of breast and artificial foods increased in weight, while only 36 % of those fed on artificial foods alone increased in weight. This shows quite conclusively that the children of the working classes, from which the patients were taken, do far better when fed on mother's milk. These observations

¹ L'Obstétrique, Dec., 1901.

² L'Obstétrique, Jan. 15, 1902.

were made from the children of mothers who had had at least 4 previous children who were well supplied with milk. The author thinks it would be very interesting to compare these results with those obtained from the comparative weights of children of primiparas or older women. Mixed diet gives better results than mother's milk between 6 months and a year; 56 % of the children thus fed gained in weight, while only 51 % of the breast-fed children took on weight.

GYNECOLOGY.

By J. MONTGOMERY BALDY, M.D., AND W. A. NEWMAN
DORLAND, M.D.,

OF PHILADELPHIA.

PRELIMINARY AND GENERAL CONSIDERATIONS.

Chronic Invalidism in Women.—[The frequency with which the condition of chronic invalidism known as neurasthenia is encountered at the present time is a matter of much interest.] Playfair¹ has done well in calling attention to this important class of cases. As he points out, it is only of recent years that the real nature of these cases has been recognized, and unfortunately even to-day it not uncommonly happens that a well-marked case of nervous exhaustion is sent to the gynecologist because the medical attendant regards some local condition as the source of the whole mischief. This is more likely to happen when the practitioner's experience of general practice has not been of long duration, and we do not see how it can be prevented. The complete ignorance of students with regard to such cases is well known. The condition is one that receives but scanty notice from the lecturer on medicine, while the obstetric physician has too much ground to cover in his short course of lectures to devote much time to a subject which is really no part of his particular work, and the result is that many students enter upon the first year of their practice with only a vague conception of what a case of neurasthenia really is and with no idea of the proper mode of treating such a case when they meet it. To Playfair more than to any other teacher is due the credit of having devoted much attention to these cases, and he was the first to bring before the notice of the profession in England the brilliant results obtained by the judicious use of the Weir Mitchell method of treatment. Unfortunately, the method has been misapplied and abused, and the result is that some men are inclined to condemn it unduly and hastily. That it is capable of giving good results there is abundant evidence to show, but, as Playfair points out, it requires to be supplemented by qualities on the part of the medical attendant and the nurse in charge which are only too often absent. The expense, too, inseparable from the treatment is in many instances a bar to its employment. Fortunately, the great majority of such cases belong to the better classes, but it is a mistake to suppose that neurasthenia or chronic invalidism is never met among poor women; it does occur, and in such instances

¹ Lancet, Sept. 21, 1901.

the prospect of cure is of the most remote character. Playfair has clearly pointed out the main conditions that tend to produce this disease. The stress and worry of modern life have much to answer for, and although it is true that most of such strain falls upon the male members of the community, yet there are many women who have to bear their full share of the troubles of life. Mental worry is a most important etiologic factor, and we are inclined to think that the fact that many women, owing to the disproportion of the sexes in this country, are condemned to the task of earning a livelihood and of fighting their own battle in life is a cause that cannot be overlooked. Whatever the etiology may be, the condition, when recognized, is not difficult to treat properly and the results are most satisfactory. Playfair is perhaps inclined to be a little optimistic about the chances of relapsing cases. Many patients are unable to carry out the course of after-treatment which he recommends, and returning to their homes long before they should, resume their life in the midst of the very surroundings which originally produced their breakdown. We may hope, in view of the greater stress laid upon the physical culture of young girls in the present age, and the undoubted improvement in their physique that has resulted, that the number of cases of neurasthenia may diminish. But even here it is necessary to utter a note of warning. Women are too apt to forget that the pursuit of various athletic exercises calls for an amount of what we may call preliminary training upon the part of the muscles which in the case of many young girls is entirely wanting. Unless, like their young brothers, they have been brought up to exercise their muscles from their earliest days, the attempt to take an active part in the manly games that are so in vogue at present at the large girls' schools in this country not uncommonly leads to disaster. The great benefits that will result from the pursuit of various outdoor games is undoubted, but at the same time the pleasures and excitements of the game and a healthy desire to emulate the feats of their older and often stronger companions lead many young girls, unless judiciously restrained, to tax their strength to an undue degree and to acquire only harm from what in moderation could not fail to be of the greatest benefit to them. Physical overexertion as well as mental strain must equally be avoided if cases of nervous exhaustion are to be banished from the catalogue of diseases.

Relation of Pelvic Disease to Insanity.—J. C. Doolittle¹ gives the results of his personal observation on the relation of diseases of women to the development of insanity, in the State Hospital for the Insane at Independence, Iowa. During the past 5 years he has examined 650 women, a little less than 300 of whom have received gynecologic treatment. Only a few received surgical treatment. Electricity, local applications, tampons, and antiseptic douches form a very considerable portion of the surgical treatment. In his judgment not one of these patients recovered from the mental derangement solely through the gynecologic treatment. In many cases the patients seemed to recover

¹ Virginia Med. Semi-Monthly, July 12, 1901.

from their mental and pelvic diseases simultaneously. In almost all cases the pelvic diseases were benefited by treatment, usually accompanied by an improvement of the general health. During a period of 2 years every woman admitted to the hospital was given a gynecologic examination. In 66 % of these cases some pathologic condition was found in the reproductive organs; in 70 there was a lacerated perineum; in 68, lacerated cervix; in 32, erosion of the cervix; in 3, cervical polypus; in 18, flexion of the uterus; in 20, other fixed displacements of the uterus; in 40, subinvolution; and in 3, uterine myoma. His conclusions, based not only upon his own experience but upon a study of the work of others, are that pelvic disorder is often associated with mental disease, and may be a factor in its causation, but it is seldom, if ever, the sole cause of insanity. No characteristic psychosis is associated with pelvic disease in women. No relation is to be found between the intensity of the mental disturbance and the severity and extent of the pelvic disease.

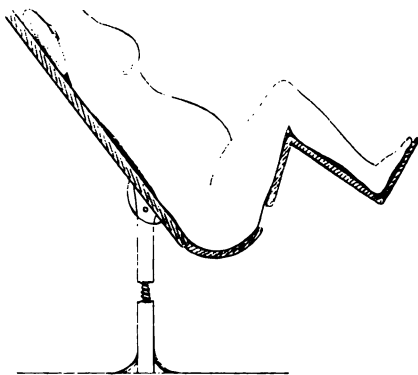


Fig. 56.—New position for gynecologic examination (Brennen, in *Le Rev. Méd. du Canada*, vol. v, No. 28).

Pelvic diseases in insane women should receive the same treatment as in the sane, and for the same reasons. Surgical operations on those of unstable and defective mental organization, and on those hereditarily predisposed, often result unfavorably and leave the patient in a worse mental condition than before the operation; this is especially true when there is no local pelvic disease. The best results from surgical operations may be expected in the hysterical and those who have marked disturbances of menstruation.

A New Position for Gynecologic Examinations.—M. T. Brennen¹ states that this novel position in gynecologic examinations has been used by him for a number of years, and has been of signal service. The accompanying illustration (Fig. 56) shows at a glance the position of the patient, and the manner in which the trunk and extremities are supported. In this position there is complete muscular relaxation, and the patient may be placed in a position varying from 45 degrees to nearly vertical, without bringing into action the muscles of the thigh or abdomen.

Blood-examination in Female Genital Disease.—[In the diagnosis of female genital affections the determination of the presence of pus is in many cases so important that all therapy and prognosis may rest upon it. The ordinary diagnostic aids—namely, history, temperature curve, exploratory aspiration, etc.—are not reliable and leave one too frequently in doubt. Curshmann, in 1901, pointed out the relation

¹ *Le Rev. Méd. du Canada*, vol. v, No. 28, p. 328, Jan. 8, 1902.

as characteristic between the white blood-cells and inflammatory processes in or about the cecum and appendix, and emphasized their great importance as a means of diagnosis. He has subsequently been supported in these contentions by other observers, such as Rieder, Von Limbeck, Grawitz, and Cabot.] M. Duetzmann¹ has recently been making similar observations and records concerning the reaction of the white blood-cells in purulent inflammations in the genital apparatus of women, seeking to establish it as a diagnostic aid in gynecology. His results are briefly as follows: Whenever there was an exudate, especially with pus or abscess formation, the great increase in the number of white blood-cells always preceded or accompanied the actual appearance of pus. Furthermore, after evacuation of such accumulations of pus, the number of white blood-cells always decreased provided the drainage was perfect. In cases in which the process was extending, the white blood-cell count was also ordinarily a good guide. His observations showed the full value of blood-examinations. Operation revealed the presence of pus even when from the symptoms it seemed unlikely that it would be found. Examples of this are furnished by cases in which streptococci were present and in which there was comparatively little systematic reaction, as is so often the case, although the danger to the patient was very great. He promises to publish, at no late date, a minute and extensive report of all these observations. They certainly concur with the examinations in surgery and their findings which have been from time to time published within the last one or two years. [Leukocytosis must be regarded only as an aid in diagnosis and not as a positive indication of the presence of pus. It will be present when there has been an acute hemorrhage or in beginning pleurisy or pneumonia just as well as in beginning abscess-formation, and even to a greater degree than when pus is present.]

The Relation of Nasal to Pelvic Affections.—Schiff² confirms Fliess's statement that on either side of the nasal septum there are spots which constantly become congested, swollen, and highly sensitive during menstruation. Dysmenorrhea can often be cut short by cocainizing these localities, and can be permanently relieved by the use of the cautery. The writer reports 200 observations upon 47 subjects. All the women suffered from severe dysmenorrhea, due in many instances to diseased adnexa. In 72 % cocainization of the "genital spots" in the septum nasi relieved only sacral pains, while similar treatment of the lower muscles of the nose directly influenced pain in the abdomen. Twelve patients were permanently relieved by the use of the cautery. Two drops of a 20 % solution are applied on cotton.

Microscopic Gynecologic Diagnosis.—[The detritus removed by curetting should in case of any doubt be examined microscopically. Such a procedure will distinguish the benign from the malignant conditions, as is briefly indicated by Brouha.³] Glandular endometritis presents multiplied, corkscrew-like, elongated glands instead of the straight

¹ *Centrabl. f. Gynäk.*, 1902, No. 14. ² *Wien. klin. Woch.*, 1901, No. 3.

³ *Gaz. de Gynécol.*, Sept. 15, 1901.

normal glands; hence its other name, hypertrophic. In hyperplastic endometritis the number of the glands is increased either by a dipping downward of the epithelium or by bifurcation of already existing glands, or by both combined. Interstitial endometritis presents augmentation of the connective-tissue elements, especially near the surface of the mucosa. Sometimes while the superficial layers are in a state of interstitial inflammation, the deeper will be either hypertrophic or hyperplastic. Clinically, the catarrhal cases are usually hypertrophic; the painful interstitial and hemorrhagic are all three combined. Placental retention is shown by chorionic villi. Old cases may be difficult, because the cell-arrangements have changed. Postabortion endometritis and sometimes ectopic gestation are best shown by the correlation between large masses of dead or dying cells comprising the old decidua and similar masses of cells characteristic of pregnancy; *i. e.*, hyperplastic. Membranous dysmenorrhea, in addition to the clinical membranous cast of the endometrium, shows a high grade of interstitial hyperplasia with decrease in the number and alteration in the arrangement of the glands. Benign hydatidiform moles present various hyperplasias, myxomatous in the stroma and chiefly hypertrophic in the villi. Deciduoma malignum is a network of cells, multinuclear and vacuolated. Uterine carcinoma may be found in its early stages, and any of its types, glandular, epitheliomatous, etc. Malign adenoma may also be discovered before it has gone far. Sarcoma with its predominating connective-tissue basis is also always to be looked for. Such examinations will always be of advantage to the patient and aid the physician in his choice of treatment.

Uterine Cough.—[Coughs of reflex origin are always difficult to treat, and none more so than those which proceed from the uterus.] L. Archambault¹ states that the following indications must be fulfilled: (1) To diminish the excitability of the reflex center in the bulb, chiefly with opium, morphin, bromids, and other sedative drugs; (2) to quiet the point of departure of the reflex, *i. e.*, the uterus itself, which must be treated for any unnatural condition existing there, such as displacements, ulcers, and the like; (3) to influence the centrifugal paths, for example, by active counterirritation over the small of the back and sometimes by stimulation of the phrenic nerve; (4) to exercise an inhibitory influence on the cerebral centers. This means that the physician should exercise suggestion with his patient and impose upon her the necessity for greater self-control. The special means of carrying out these various indications are sufficiently common in the knowledge of everybody to make mention unnecessary.

Genital Tuberculosis in Woman.—An exhaustive thesis on this subject by M. Gorovitz² is concluded as follows: (1) Genital tuberculosis in woman is much more frequent than was formerly thought. This is proved only by histologic and bacteriologic examination by inoculation in cases which formerly might have escaped diagnosis. (2) It is often secondary, sometimes primary. In the primary cases it is only by careful

¹ Gaz. de Gynéc., Oct. 15, 1901.

² Rev. de Chir., Oct., 1901.

examination that the diagnosis can be proved. The disease may affect the mucous membrane of the womb or of the tubes. (3) By clinical facts and by surgical operations it has been learned that this tuberculosis of the tubes excites in the peritoneum more or less active trouble, and in particular a special form of inflammation accompanied by the formation of small cysts. (4) It is therefore necessary, in opening the abdomen of women who have a tuberculous peritonitis, to examine the tubes and see whether they are or are not the source of the disease; if they are, they should be removed. (5) Such removal should always be made by the abdominal route because the extirpation should be wide and the abdominal wound large enough to permit treatment of the disease elsewhere. (6) From the standpoint of origin of the disease it may be said that it may be a descending or an ascending affection, the former being the more frequent. (7) It is clinically proved that infection may be carried by the spermatozoa of consumptive patients. (8) Experimental researches show that living tubercle bacilli deposited on a mucous membrane without wounds may easily cause the disease. According to Hauschka,¹ there are two symptoms which usually differentiate primary from secondary tuberculosis. First, the secondary is marked by a ring-formed swelling of the portio vaginalis, while in the primary tuberculosis there are knot-like tumors which take the papillary form, sometimes mistaken for carcinoma and which result from the long duration of the disease. The second symptom is the frequent and striking periodic return of amenorrhea.

Sterility.—Chrobak² discusses the causes of sterility and their remedy. These may exist in the woman's general condition, as sterility is frequently due to chlorosis, anemia, intestinal disorders, or to the use of unknown medicaments, as iodoform, quicksilver, morphin, etc. Or its cause may be gynecologic and yield to local treatment. Many writers consider that lack of sexual sensibility may be the cause, but Chrobak thinks that this itself is usually due to some pathologic condition, such as slight hypoplasia of the uterus with amenorrhea or scant menstruation or lactation, atrophy, etc. In such cases some strong stimulus to the uterus should be employed, as electricity, massage, the sound, or sometimes pessary treatment; frequently, under such methods, a normal sexual sensibility is restored. He mentions other conditions which require blunt dilation of the cervix; others in which discission is necessary, a transverse incision of the vaginal wall, or perhaps some plastic operation, as perincorrhaphy, colporrhaphy, or colpoperineorrhaphy. But he concludes with the remark that all the care which may be directed to uterine anomalies will be fruitless unless full attention is given to the general condition of the individual; that the physician, as well as the gynecologist, may be needed.

Facultative Sterility.—This term is applied by Ludwig Pincus³ to sterility in women induced artificially by destroying the capacity of the endometrium as an organ of nidation. The procedure which he advocates for accomplishing this result is uterine atmocausis, the steam being

¹ Wien. klin. Woch., Dec. 19, 1901. ² Wien. klin. Woch., Dec. 19, 1901.

³ Centralbl. f. Gynäk., Feb. 22, 1902.

applied for about a minute at a temperature of from 230° to 233.6° F., and the application repeated in 3 weeks if necessary. Two cases are reported in which the method was employed, and in neither of them has the menstrual flow ever recurred, although Pincus seems to admit the possibility that the cervical mucous membrane, which remained intact, may eventually take on a menstrual function. Obliteration of the uterine cavity does not necessarily take place, and it is properly regarded as undesirable that it should; when it does not, we may suppose that the resulting sterility is not absolute, for there is still a way open for the spermatozooids to reach the ova, and some form of extrauterine gestation may be the consequence. Still, the approach to absolute sterility must be so close that practically the lack of completeness is negligible. ["Facultative sterility" seems a convenient term to apply to the virtual sterility of women thus induced, and it seems, further, a suitable term for the sterility of men brought about by occlusion of the vasa deferentia. But we must protest against the terms *castratio mulieris uterina* (the title of Pincus's article) and *castratio uterina atmocaustica*. The procedure is not in any sense castration, although in one particular it practically accomplishes what is sometimes aimed at—under the misapplied name of castration—in excision of the ovaries.]

Gonorrhea in Women.—An editorial¹ remarks that it is very difficult to determine the frequency of gonorrhea in women. On one hand, according to Noeggerath, 80 % of women are affected with gonorrhea; while, on the other, in 1930 women attending Sanger's clinic, the percentage was only 12, and Penrose affirms that it is rare in the gynecologic dispensaries of Philadelphia to see acute gonorrhea of any portion of the genitourinary tract. In investigating this subject it is important to make a distinction between prostitutes and reputable women; for in the first class such a large proportion are affected with the disease, either in the acute or chronic form, that any percentage which includes these would be misleading as far as it relates to the spread of the disease. However, the majority of American gynecologists will probably coincide with Wertheim in the statement that gonorrhea is the most frequent cause of suppuration in pelvic disease. Repeatedly cases are observed in which innocent wives are the victims of the husbands' antemarital disease, and the question of the time at which the marriage of a gonorrheic is advisable becomes an extremely important one; for although the primary symptoms of gonorrhea in the female may be slight, the extension of the disease to the uterus and appendages is so certain that unless vigorous treatment is employed marked lesions will result that will most certainly injure the health and impair the reproductive power of the individual. Gonorrhea in the male, when uncomplicated, may be a simple disease to be treated as lightly as a nasal catarrh or any other slight mucous membrane inflammation, yet in women this affection often entails years of suffering and a lifetime of disappointment if sterility is produced. White has spoken of cases of chronic urethritis in which the gonococcus may retain its vitality for 2 or 3 years, and men with such imperfectly cured gonorrhea are permitted to

¹ Amer. Med., Jan. 11, 1901.

marry, entirely ignorant of the consequences of such a course. No man who has been guilty of anteconnubial indiscretions or youthful immorality would wittingly cause infection of his wife, or, possibly, ophthalmia neonatorum of his child; so the physician must be the arbiter of the patient's action and see that men are instructed in regard to the consequence of venereal disease, both immediate and remote. According to Behrens, the microscopic detection of the gonococcus is so uncertain as to render this means of diagnosis unreliable, so that the physician must be guided by a careful study of the clinical symptoms as well, for there may be a permanent or intermittent disappearance of gonococci with a further manifestation of clinical symptoms, or these may subside and yet the microorganism be detected. This emphasizes the fact that the physician should be cautious before deciding whether or not his patient is cured, and whether marriage would be free from the danger of transmission of venereal disease. T. W. Eden¹ thinks that the points upon which we should rely with regard to an early diagnosis are, first of all, the characters of the discharge, and, secondly, the distribution of the inflammation. In the early stages the patient complains of a yellow discharge which is almost pure pus. The number of conditions giving rise to a true purulent discharge from the vagina is small; gonorrheal discharge, although purulent, is not fetid. The discharges of this kind from the vagina are usually ill-smelling. A pelvic abscess, which has emptied itself into the vagina, whether it be a pyosalpinx, ovarian abscess, or suppurating cyst, practically always discharges stinking pus. A neglected vaginal pessary is one of the most frequent causes of offensive purulent vaginal discharge. The author goes on to distinguish between an ordinary acute vaginitis, which is very rare, and specific vaginitis; he points out that the differential diagnosis of the diplococcus of gonorrhea from other diplococci can only be made by a skilled bacteriologist. Treating of the distribution of the acute disease, the author notes the curious fact that "the stress of the inflammation is very apt to fall on different parts of the genital tract." The commonest variety is that in which the chief symptoms arise from inflammation of the vulva. It is stated by some authors that cases occur in which the vulva and the vagina escape entirely and are not involved in the inflammation at all, the primary inflammatory lesion being in the cervix. Eden, however, has never seen one in which "the primary lesion was uterine, and there was reason to believe that the vulva and the vagina escaped." The next point of importance is that the distribution of the lesions shows a tendency to spread through every possible channel that is open to it. The affection of Bartholin's glands and the urethra is by continuity; the disease "spreads through the patent meatus and down the Bartholin ducts, and so affects these glands and the urethra." Cervical gonorrhea is not much described, but it is a very definite and well-recognized lesion; from it the disease may spread to the uterine body, and so on to the fallopian tubes and peritoneum. The treatment is not satisfactory; drugs are quite unreliable. Vaginal douching is quite inadequate, even when properly carried out. The best treatment consists in

¹ Clin. Jour., 1901, No. 464, p. 343.

rubbing over the vaginal mucous membrane with a 1 : 1000 solution of mercuric chlorid through a Sims speculum.

Gonorrhea in Prostitutes.—Prome¹ reports the results of the systematic hospital treatment of prostitutes in San Salvador, where the opportunities for the study of venereal diseases are apparently unequalled. Out of 407 patients, 313 had gonorrhea. The writer affirms that it is not easy to recognize gonorrheal endometritis at its inception. Enlargement and tenderness of the uterus, with accompanying amenorrhea, gastric disturbances, etc., point to the extension of the infection from the vagina. The adnexa were affected in 68 % of all cases, 5 % showing acute salpingitis; 81 % were sterile. The writer notes that nulliparas with anteflexed wombs seem to be less prone to diseases of the adnexa, and explains this on the theory that the atonic uterus in these cases does not contract at the height of the orgasm and thus favor the draining up of gonorrheal discharges into its cavity; experiments showed that infection was not produced by the contact of gonorrheal pus with intact epithelial surfaces. Moreover, the presence of a few gonococci in the vaginal secretions of prostitutes is not proof of its infectiousness. The writer favors curetment in acute infection of the endometrium, as a timely resort to this operation sometimes prevents extension to the tubes. In 20 subacute cases curetment caused the disappearance of exudates, and the emptying of a pyosalpinx into the uterine cavity (?), although the relief was usually only temporary. Reinfection of a patient who was discharged from the hospital as cured was rarely observed.

Gonorrhea and Marriage.—Zeissl² replies to the question, "When may a man with gonorrhea marry?" that marriage is allowable only when repeated clinical and bacteriologic examinations give an absolutely negative result. The absence of gonococci in the secretions is not sufficient, but the patient must still be kept under observation until he is beyond suspicion. The presence of opalescent threads in the urine shows that the discharge has probably ceased to be infectious. This opinion is strengthened if only a few round epithelial cells are seen under the microscope. If diplococci are found, even though these do not grow in cultures, the innocent character of the secretion cannot yet be inferred. If no additional information can be obtained by the use of the endoscope, the writer recommends that the patient should use an irritating injection of nitrate of silver and drink beer frequently. If a free discharge from the urethra appears, and at once ceases spontaneously and no gonococci reappear, the patient may be regarded as cured.

AFFECTIONS OF THE VULVA, VAGINA, RECTUM, AND BREAST.

Kraurosis Vulvæ and Cancer.—Holleman³ publishes a case where it appeared that kraurosis became cancerous, the connection

¹ Centralbl. f. Gynäk., 1901, No. 3.

² Wien. med. Presse, Der Frauenarzt, Sept. 20, 1901.

³ Nederl. Tijdschr. van Verlosk en Gynaec., 1900.

between the two disorders being, at least in this instance, not accidental. The patient was a robust maiden lady, aged 66, previously in excellent health. Itching of the vulva began 10 years before observation without leukorrhea. Over 2 months before she had consulted Holleman small pustules developed on the right labium; she remembered that a few months previously she suffered from darting pains in the right inguinal region. The pustules were painless, but bled on touch; they grew slowly and became harder as they increased in size. The labia majora and minora were of the characteristic mother-of-pearl hue, as was the clitoris; the hymen and prepuce were thickened; near the posterior commissure was a tuberos, ulcerating, and slightly oozing tumor as big as a crown-piece. No enlarged inguinal glands could be detected. The tumor was removed and proved to be epithelioma. For a year there was no sign of recurrence, then a characteristic tumor developed in the right groin. Paquelin's cautery is not the best agent for removing vulval epithelioma, as it does not allow the surgeon to see if he is cutting into healthy tissues.

Pruritus Vulvæ.—L. Seeligmann¹ has investigated the condition known as pruritus vulvæ bacteriologically—dealing chiefly with those cases in which the primary cause cannot be found, or no layer is present, and, therefore, with the class generally believed to be a true neurosis, and not with cases of kraurosis vulvæ. In the latter the skin changes are definite, and it has nothing whatever to do with pruritus. Seeligmann found in the skin of the vulva of patients suffering from pruritus a diplococcus which has definite characteristics. It is obtained generally in pure culture, but after the cases had been cured he always failed to cultivate any of the microorganisms at all. It is like the gonococcus, but differs from it by its behavior toward Gram's staining, and in cultures. It is readily stained by anilin stains and also by Gram's method. It grows readily on agar-agar, glycerin-agar, bouillon (with unpleasant odor), potato, yeast-bouillon (with a most objectionable odor), and slowly on gelatin. The cultures are easily killed in 5 minutes by 10 % solutions of guaiacol-vasogen, applied by a pledget of cotton-wool to the affected part at night-time (the wool is allowed to remain *in situ* all night). This is usually sufficient to cure the condition in a few days, but at times it may be necessary to continue the treatment for a longer period, or to use stronger solutions (15 % to 20 %). Care must be exercised, if strong solutions are used, that the skin is not irritated too much. L. Siebourg² makes the following contribution on the treatment of this vexatious and persistent condition. It was suggested by the fact that often after a copious subcutaneous injection of normal salt solution the skin will remain for several days either deprived of sensation or with depressed sensation. He does not seem to imply that all his cases are subjected to this treatment. He ordinarily manages them by having the causes fully removed when possible; for example, acrid vaginal and uterine discharges, diabetes, cystitis, foul pessaries, pudendal vermin, etc. When the cause has been

¹ Deut. med. Woch., Feb. 27, 1902.

² Centralbl. f. Gynäk., 1901, No. 20.

ascertained and removed, he finds that ordinarily the itching disappears, but sometimes that patients are so nervous and irritated by their former trouble that the injured skin continues to be irritated, and a pruritus which ought to have vanished with its cause is maintained. For such cases he finds good hygiene, as to food, exercise, sleep, baths, coitus, and douches, of great importance. Then resort may be had to some lotion producing anesthesia; for example, one containing cocain, menthol, and phenol. Several ointments are of signal use even if the skin and mucosa are broken. His favorite is cocain 2, menthol 5, phenol 1, and vaselin 20 parts, spread upon gauze and held tightly in place with a T-bandage. In the more chronic cases he has the patient paint the parts with a mixture containing spir. rusci 50, acid salic. 5, resorcin 1 part, night and morning. When these means have failed, he uses injections of copious quantities of normal salt solution until the vulva is much swollen in both the skin and mucous aspects. The idea is to rupture by distention, if possible, the fine nerve-filaments and thus destroy the itching. Various medicaments might be added, but the simple saline solution is the least dangerous. His success has up to the present time been very marked. Tavel¹ advocates resection of the internal pudic nerve in the treatment of obstinate vaginismus and pruritus of the vulva, and reports 2 cases in which he applied this treatment with good results. [This method of dealing with painful affections of the external genital organs of the female, though first practised by Simpson, of Edinburgh, 40 years ago, has not, it seems, been repeated by other surgeons for vaginismus, although it has occasionally been tried for the relief of certain forms of chronic urethrocystitis.] The author discusses at length the surgical anatomy of the internal pudic nerve and its different branches, and describes his method of operating on this nerve. The external incision on either side of the perineum, which is about 4 inches in length, is carried directly from before backward in the middle of the fossa between the tuberosity of the ischium and the outer margin of the anus. The nerve—the course of which is indicated by the pulsations of the accompanying artery—is carefully separated from this vessel and followed backward to its trunk. The main divisions supplying the muscles of the vulva and the painful area of integument are divided near their origins, and in the peripheral portions of the nerve twisted and torn away. In this operation care must be taken to avoid the inferior hemorrhoidal nerve and the anal twigs of the deep perineal branch.

The Treatment of Vaginismus by the Colpeurynter.—Huppert² calls attention to the difficulties which attend the treatment of vaginismus by the introduction of speculums and plugs. These difficulties are easily explained by the increased sensitiveness, abnormal narrowness, or inflammatory condition of the introitus vaginae, which naturally interfere, as is well known, with the introduction of the ordinary glass or hard-rubber speculum. These, especially during their introduction, excite the very pains and cramp-like contractions of the vagina

¹ Canad. Pract. and Rev., April, 1902.

² Centralbl. f. Gynäk., 1901, No. 32.

which are the reason for treatment. By the employment of the soft-rubber colpeurynter the author is able to introduce the collapsed instrument without pain. Cocainization of the introitus is a valuable aid. After dilation of the bag by the introduction of fluid through a syringe until the patient begins to complain of slight discomfort, the procedure is stopped until the pain passes off; then the fluid is drained off and the colpeurynter refilled once or twice more, and at the last filling allowed to remain in place half an hour or so. Then the fluid is allowed to drain off, and the instrument may be removed without the slightest irritation. In order to gage the amount of increase at each sitting the writer employed a graduated syringe. After 2 or 3 weekly sittings the writer found that he could introduce without difficulty a speculum 3 cm. in diameter. The colpeurynter was then introduced, with slight or no cocainization, a few times, and followed by the speculum, and the patient then discharged. Coitus, which had been absolutely prohibited during treatment, was now allowed. As most of his cases concerned young married women, the writer had the satisfaction of noting that conception took place soon after the cessation of treatment in several cases. The hypersensitiveness of the vulva and introitus was combated with Goulard's solution, or a wash of alum and plumbic acetate, or painting with 3 % to 5 % solution of silver nitrate. The strongest cocain solution employed was 10 %. The advantages of the treatment by the colpeurynter over the employment of hard speculums are evident, since it is necessary to avoid the slightest irritation of the vulva and vagina, which will at once excite the dreaded spasm of the vagina and destroy the patient's confidence in the method of treatment. The very gradual and universal dilation by the colpeurynter contrasts favorably with the sudden pushing open of the vagina by the end of a cylinder. The writer notes that his method was successful in the treatment of vaginismus complicated by inflammatory conditions, and that finally he was able to avoid in all his cases operative procedures, such as excision of the hymen or division of the constrictor vaginae muscle. He also was successful in avoiding recurrence.

Genital Atresia.—Labusquière¹ believes that the majority of atresiae are acquired, and hence that it may be possible to prevent them. He advises that not only should a routine examination of the external genitals of the newborn be made, especially when the mother has a gonorrheal discharge, but the prophylactic treatment should be adopted in the shape of antiseptic lotions. The same solution of silver nitrate which is instilled into the eyes may be used with advantage. So-called precocious menstruation is always to be regarded with suspicion as a possible evidence of gonorrheal infection, and an examination should be made to ascertain whether the latter is present. Cases of persistent leukorrhea in little girls may result in atresia, so that it is advisable to prove its absence by the careful introduction of a sound. Prolonged absence of the catamenial flow in girls at the age of puberty may justify an examination, especially if there is a history

¹ Ann. de Gynéc. et d'Obstét., No. 8, 1901.

of a previous infection. The presence of menstrual molimina, or even vicarious hemorrhage, does not contraindicate such an investigation. Referring to the development of hematosalpinx in connection with genital atresia, the writer affirms that when the enlargement of the tube is due to simple retention of blood, and is not of inflammatory origin, as shown by the persistent abdominal pains, primary laparotomy is not justifiable. It is better first to evacuate the retained blood per vaginam if possible, abdominal section being performed later if necessary.

Leukorrhea.—P. Chapelle¹ remarks that yeast in the treatment of chronic leukorrhea, and vaginitis due to gonorrheal infection, has recently been tried with considerable success. Landau, of Berlin, was the first to apply it locally by injection for troublesome vaginal secretions, and found small quantities produced a rapid and complete arrest of the discharge after a few weeks. Murer, in France, has used it in the same manner in gonorrheal discharges from the vagina, and found yeast most effective in suppressing inflammation of the mucous membranes, which regained their normal color rapidly. In the gonorrhea of men, however, it was not uniformly successful. In leukorrhea and gonorrheal vaginitis there occurs a substitution of a morbid fermentation for a nondangerous yeast fermentation, for the yeast-cells (*Saccharomyces cerevisæ*) appear to devour the morbid germs, which set up inflammatory conditions. Baeker, who has made a study of the various ferments, is of the opinion that the natural toxins, however altered, may in the treatment of disease be replaced with advantage by ferments in the living state. He considers good health to be one of normal fermentation, and bad health, one of morbid fermentation. Hence, pure ferments like yeast attract pathogenic germs, allow themselves to be penetrated by them, and, once developed, destroy them by a true phagocytosis. D'Arsonval and Charrin have also made a series of investigations on the reciprocal action of microbes on vegetable cellular tissues, and it would appear that in the case of yeast, in its struggle with pathogenic germs, it expends its energy as a ferment, acting consequently by reason of its phagocytic properties. The treatment of leukorrhea and other vaginal discharges with yeast is based on reasonable grounds, and it should, therefore, be tried in obstinate cases which do not yield to tonics and the usual local treatment.

Injuries to the Vagina during Coitus.—Bohnstedt² reviews the literature on this subject, giving the details of a case in his own practice, showing that some other etiologic factor for rupture of the vault of the vagina during coitus must be inferred, since in 70 % of the reported cases the women were either not virgins or had borne children. If they were due to violence on the part of the male, they ought to be of common occurrence in prostitutes, which is not true. The histories show that in nearly every instance there was marked sexual excitement on the part of the female, which may cause a sudden increase in the intraabdominal pressure, thus forcing the vaginal vault down-

¹ Pacific Med. Jour., Dec., 1901.

² Centralbl. f. Gynäk., 1901, No. 22.

ward. This question may assume considerable medicolegal importance in cases of supposed rape, from its bearing on the voluntary submission or resistance of the female.

Cystocele.—The dismal failures reported in the usual operation for cystocele have induced J. B. Taulbee¹ to attempt the radical cure of that condition by temporary suspension of the bladder. This operation was practised on a woman, aged 63 years, who had a cystocele the size of a large orange protruding from the vulva. This condition had existed for 6 years; during most of this time relief could be obtained only by having the patient remain in a recumbent position. In performing the operation dissection was begun anterior to the cervix uteri, as for hysterectomy. The peritoneum was stripped from the bladder with the finger and blunt instruments. The wound was packed with gauze. The abdomen was then opened in the linea alba for a distance of 5 inches immediately above the symphysis pubis. The bladder, distended with sterile water, was grasped with dull forceps and drawn forward. Sutures were passed through the muscular coat of the bladder, on either side of the median line, for a distance of $1\frac{1}{2}$ inches, $\frac{3}{4}$ of an inch from the median line and parallel; the ends were held outside the wound. The outer coat was next denuded in the median line between the sutures, and by a semicurved ligature-carrier the free ends were carried through the abdominal wall, their exit made to correspond with the position of exit of the bladder, and the ends secured by locked forceps dropped to the sides of the abdomen. The wound was closed by a subcutaneous continued suture. The free ends of the suspension sutures were drawn taut and fastened over rolled bolsters of sterile gauze. The patient was then placed in Sims's position and the gauze packings from the vaginal wound were removed. The abraded surfaces of peritoneum were approximated by catgut, and a colporrhaphy followed. A narrow opening was left for drainage of the space in front of the bladder. On the thirtieth day the silkwormgut ligatures were loosened and withdrawn, and the patient was discharged the fortieth day. Taulbee states that the most difficult features of the operation are in properly divesting the bladder of its peritoneal covering and reapproximating the same, and properly inserting ligatures and denuding the area which is to adhere to the pelvic or abdominal fascia. Priority for the operation is claimed. J. Brettauer² recommends the use of the uterus in increasing the strength of the anterior vaginal wall, an operation which has heretofore been performed a few times. An incision is made through the anterior vaginal wall extending backward from the urethral opening; the parts are separated; the uterus is markedly anteverted and brought down into the wound, thus lying between the anterior vaginal wall and the bladder. It is then stitched in place and a part of the vaginal wall resected before it is sewn up. [Of course, this operation is suitable only in women beyond the child-bearing period.] The results in 3 cases seem very satisfactory.

Primary Cancer of the Vagina.—[Primary cancer of the vagina

¹ Am. Gyn. and Obstet. Jour., Sept., 1901. ² N. Y. Med. Jour., Jan. 11, 1902.

is very rare, but not very hard to diagnose, as all ulcers of the vagina proper are rare, and a definite ulceration, cancerous in character and not involving the cervix and body of the uterus, will attract the surgeon's attention; besides, it is a condition which almost suggests its true nature.] Roger Williams¹ has observed 5 cases, and his data, derived from patients under treatment at the chief London hospitals, show that only 0.43 % of all cancers in women are of vaginal origin. Some foreign authorities make the percentage as low as 0.38 or as high as 1.6. The earliest age at the outset of the disease was 17, for in Johannovsky's patient, aged 9, the growth was evidently sarcomatous, and in Guersant's, a child only 3 years of age, the nature of the tumor remains doubtful. Cancer of the vagina has commenced to develop after 70. In 26 cases where the age was accurately given the onset of the disease occurred thus: Third decade (20 to 30), 12 cases; fourth, 14 cases; fifth, 12 cases; sixth, 22 cases; seventh, 14 cases; and eighth, 2 cases. Thus most cases arise long after the menopause, and hence it may be inferred that the origin of the disease has no direct connection with the incidents of reproductive life. One-fourth of the total number of patients have never been pregnant. The disease has often made considerable progress before any indications of its existence are apparent. Of 16 cases in Williams's own list the first symptom was discharge in 9, pain in 3, a lump near the vaginal orifice in 2, retention of urine in 1, and inguinal adenopathy in 1. Williams gives an instructive bibliography, including Bernard's "*Epithélioma primitif du Vagin*."² Hubert Roberts³ published a case of primary epithelioma of the vagina in 1896.

Fibromyomatous Tumors of the Vagina.—The conclusions in this paper are drawn from a study by R. R. Smith⁴ of 100 cases reported in literature and one case which came under his own observation in May, 1901. He also gives an abstract of 47 cases which occurred since 1882, Kleinwächter having collected 53 previous to that time. His summary is as follows: Fibroma (myoma and fibromyoma) of the vagina is a rare disease. It occurs most frequently in women between 30 and 40, but has been observed at ages ranging from 20 to 70. The cases observed in infancy are open to some doubt as to diagnosis. Apparently it occurs independently of civil condition. No proof can be deducted to show that it affects fertility. It may obstruct labor when large. When the growth is small, it rarely affects coitus, and may not do so even though the growth be large. There is some evidence that in certain cases menstruation may be increased. The tumors, when small, rarely produce symptoms of consequence; when large, they may prove to be the source of considerable suffering and even danger. The symptoms, when present, are pain, hemorrhage, discharge, obstruction to bladder and rarely to bowel. No exact division of the case into fibroma, myoma, and fibromyoma can as yet be made. The term fibromyoma will probably cover most of them, but pure fibroids

¹ N. Y. Med. Rec., Nov. 30, 1901.

² Thèse de Paris, 1895.

³ Trans. Obstet. Soc., vol. xxxviii, p. 381.

⁴ Am. Jour. Obstet., Feb., 1902.

have been observed. Pure myomas may also exist. The tumors grow from the anterior and posterior wall in proportions of about two to one. They may be sessile or polypoid, vary greatly in size, and are single with very rare exceptions. They are, as a rule, very slow in growth, and are prone to edema, necrosis, and ulceration. The treatment is essentially surgical.

Stricture of the Rectum in Women due to Inflammatory Processes in the Pelvis.—J. L. Rothrock¹ considers that by far the more common pathologic conditions which cause stricture have their origin within the rectum, or in its walls. Of lesser etiologic moment are to be mentioned changes without the rectum, lying in close proximity, among which are tumors filling the small pelvis, and inflammatory processes. Pressure from the gravid uterus or benign tumors, while they may produce constipation, seldom interfere with the passage of the intestinal contents. On the other hand, malignant tumors may infiltrate the perirectal tissue, or even the wall of the rectum, and produce stricture. Large pelvic exudates may so fill the pelvis that by pressure on the rectum free passage of the stools is obstructed, while later the contraction of perimetritic adhesions may also lead to constriction. Three cases due to this cause are reported by Rothrock. One case was that of pelvic inflammation, involving chiefly the parametria. Finally, upon opening the abdomen the pelvis was found to be filled with an exudate of stone-like hardness, in which the uterus and adnexa were fixed. The wall of the upper portion of the rectum was markedly infiltrated and surrounded by the exudate. An inguinal colotomy was performed, following which for several weeks the bowels moved entirely through the artificial anus. Later the exudate and stricture disappeared. The other two cases, while only partial, gave rise to serious inconvenience, one requiring a prolonged course of dilation before the patient was relieved.

Present Position in Relation to Mammary Cancer.—Sir William M. Banks² believes that cancer is increasing in frequency; that it is probably most common in low areas which are often flooded and are characterized by alluvium and subsoil; that it is not among the wretched and half-starved that this disease is most prone to occur, but rather among the healthy and well-fed; and among men who eat heavy food in ever-increasing quantities the proportionate increase of cancer is greater than among women. In England the classes most prone to this disease and among which the increase is most marked are those who eat and drink abundantly and do not take much exercise. To-day the modern scientific inquirer asserts that there is nothing constitutional at all about cancer, that it is a purely local disease; but Banks thinks that a hereditary tendency to cancer is transmissible. Sometimes mammary cancer may be due to a traumatism. Conditions closely simulating mammary cancer are chronic mastitis, a small chronic abscess, or a small fibroadenoma. When there is any doubt,

¹ Northwestern Lancet, Mar. 15, 1902.

² Liverpool Med.-Chir. Jour., Mar., 1902.

put in a small trocar and make the diagnosis sure. Recent investigations seem to have demonstrated the existence of cancer bodies or parasites, which are always found at the marginal parts of carcinomatous tumors where the most active growth is going on. They multiply by dividing into two by the process of budding, some say by spores. These structures are not found in any healthy tissues, and in no other neoplasm except sarcoma. Many investigators regard this cancer body as a blastomycetes, which is a developmental stage of certain fungi. These parasites are mostly inside the epithelial cancer-cells, and doubtless act as an irritant, causing them to proliferate. From these parasites cultures in certain mediums can be made, which, injected into animals, produce growths of a fatal character which contain these parasites. Banks is of the opinion that the infectivity of cancer has not been clearly proved, and that this is not the time for positive assertion but for patient experiment and collection of facts.

Oophorectomy for Cancer of the Breast.—Butlin¹ says there are three objects in view in operating for cancer of the breast: First, the hope which may be held out to a goodly number of women nowadays that operation may be quite successful. Secondly, that if the disease kills the patient, it may do so by recurring in some distant organ and with much less pain and suffering. Thirdly, that if it recurs *in situ* in the form of nodules, the patients generally suffer far less than if no operation had been performed. These objects are usually attained by the method of removing the breast, and Butlin opposes abandoning this procedure for oophorectomy: First, because he does not know of a single case in which a claim can be substantiated that a patient has been cured by oophorectomy. Secondly, when the disease comes back again, as it generally does in 6 months or a year, if not more quickly, it does so exactly in the same form and with all the same troubles as were present at the time of operation, and the patient grows slowly worse and dies. The manner of her death and the distress of it are not in the least changed by oophorectomy. Lastly, it must be admitted that a very large number of women on whom oophorectomy has been performed, and who have been soaked in thyroid extract, have not received the smallest benefit in the world. He admits that the advocates of oophorectomy may fairly say that it has been for the most part employed in very grave cases, and he would not blame a surgeon who would perform oophorectomy upon a series of 20 or 25 women who have cancer of the breast to a limited extent and are willing to take the risk, but personally he has not the courage or faith to do it himself.

PERINEORRHAPHY.

Laceration of the Perineum.—Bovée² describes some points in the technic of operations for perineal laceration that are quite unique and interesting. He claims nothing new for the suggestions, but merely a combination of interesting points, all taken from the work and rec-

¹ Brit. Med. Jour., Jan. 4, 1902.

² Am. Jour. Obstet., Mar., 1902.

ommendations of various surgeons. It embodies largely the principles of Emmet, the ideas of Tait of putting the sutures through the subdermal structures only and of employing buried absorbable material, kangaroo tendon, and Ristini's modification in complete laceration—the result being that all important sutures are buried and none whatever need removal, that the wound is well protected against subsequent infection, and that the results are very satisfactory. The operation in incomplete laceration is done as follows: Grasping the lowest myrtiform caruncle on either side, the tongue of mucous membrane in the posterior wall and the upper end of the sulcus which represents the laceration, on one or both sides as may be necessary, the mucous membrane is removed as usually done by Emmet, though in some cases the plan of Tait in this respect is followed. If the Emmet denudation is done, the mucous membrane on the two sides of the denuded triangle is partially or completely approximated with continuous over-and-over catgut sutures. When partially approximated, the suture is placed, but not drawn taut until the deeper structures are approximated. When this is finished, the forceps are removed from the points high in the vagina. While sufficient traction is made upon the middle tongue of tissue in the posterior wall to bring it forward and upward to the position it formerly occupied, a continuous suture of kangaroo tendon is used to close the lateral triangular spaces in the sulcus representing the original tear. This suturing is brought to about 1 inch from the perineal skin and tied. The sutures do not enter the rectal or vaginal mucosa. The remainder of the perineal wound is now closed precisely as by Tait, except that kangaroo tendon is employed and the ends cut close to the knot. The skin closes over, leaving them unexposed. For complete laceration the surfaces are denuded as described by Ristini, which causes a flap to be dropped downward, covering the rectum in front. Then a row of continuous catgut or fine kangaroo tendon, beginning at the upper end of the crater and close to the base of the flap and ending at the sphincter ani muscle, is placed to approximate the structures just immediately above or in front of the flap. The ends of this torn muscle are dissected out and united by 2 to 4 interrupted sutures of catgut or tendon after carefully stretching it. The suturing of the vaginal mucosa is now placed, and following comes the insertion of the deep sutures, 3 or 4 in number, as in the operations for incomplete laceration. Particular care is necessary to include the whole septum down to the rectal flap, and in all cases that the sutures pass sufficiently deep laterally to make the opposed surfaces between the bottom of the wound and the skin surface as long as possible. The after-treatment consists in keeping the skin side of the perineum covered with bichlorid gauze, the bowels emptied daily, catheterization for a few days, and liquid diet for the first 5 days. The patient is allowed out of bed in 2 weeks.

G. H. Noble¹ describes a new operation designed for the purpose of eliminating the danger of infection from the rectum. It consists

¹ Jour. Am. Med. Assoc., Aug. 9, 1902.

in splitting the rectovaginal septum, dissecting the lower end of the rectum from the vagina, and drawing its anterior wall down through and external to the anus. In this way it converts a complete tear of the perineum into an incomplete laceration. The line of incision (black line, Fig. 57) starts on the external side of the sphincter dimple at a point close to one end of the sphincter muscle (*Sm*, Fig. 57). It follows the edge of the sheath of the muscle, passing between it and the rectal mucosa, making the flap at this point as thick as possible. It then turns upward and forward to the cellular interspace of the rectovaginal septum (*S*, Fig. 57) and follows along the edge of the septum, splitting it in the center, and returns on the opposite side to a place corresponding to the starting-point. This makes an incision similar to the ordinary flap-splitting operation, except at the extremities. The incision is best made with a pair of sharp-pointed scissors.

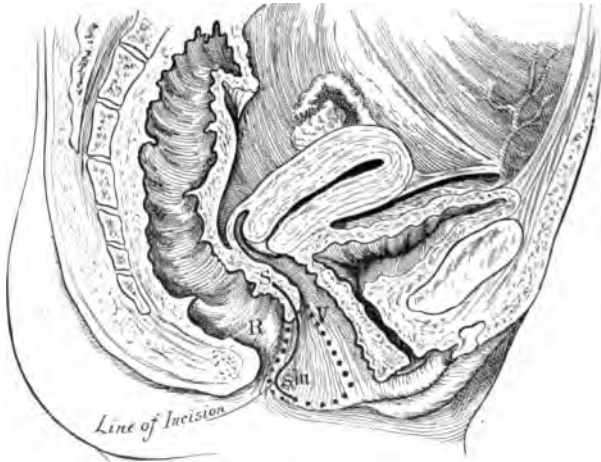


Fig. 57.—The black line of incision starts on the external side of the sphincter dimple at a point close to one end of the sphincter muscle (*Sm*). It follows the edge of the sheath of the muscle, passing between it and the rectal mucosa, then turns upward and forward to the cellular interspace of the rectovaginal septum (*S*) and follows along the edge of the septum, splitting it in the center. It returns on the opposite side to a place corresponding to the starting-point (Soble, in Jour. Am. Med. Assoc., Aug. 9, 1902).

After cutting through the cicatricial structures to the healthy tissue beneath, two pairs of light compression forceps are placed on the rectal margin some distance on either side of the center, embracing in their grasp the entire thickness of the rectum. The index-finger of the left hand should be protected with a long finger-cot or rubber glove and passed into the rectum beyond the angle of the laceration as a guide to prevent perforation of the rectal flap. The forceps are held with the remaining fingers of the left hand, and, as slight traction is made upon them, ridges or bands of tissue will form across the line of incision (I, Fig. 58). Dissection is continued by cutting these bands as they appear. In this way unnecessary cutting and bleeding will be avoided. The point of the scissors should be turned slightly in the direction of the vagina,—that is, away from the rectum,—for traction displaces

its anterior wall, adding to liability of perforating the latter. Unless care is observed, the tendency will be to cut the flap too thin, not embracing the entire thickness of the rectum, but this can be avoided by confining the cutting to the cellular interspace. The objections to thin flaps or those consisting of mucous membrane only are susceptibility to injury, inability to hold tension sutures, and imperfect protection against rectal infection, due to inferior vitality. Even the thicker flaps should be handled delicately and only slight tension put upon them, for the sides adjacent to the sphincter muscle are neces-

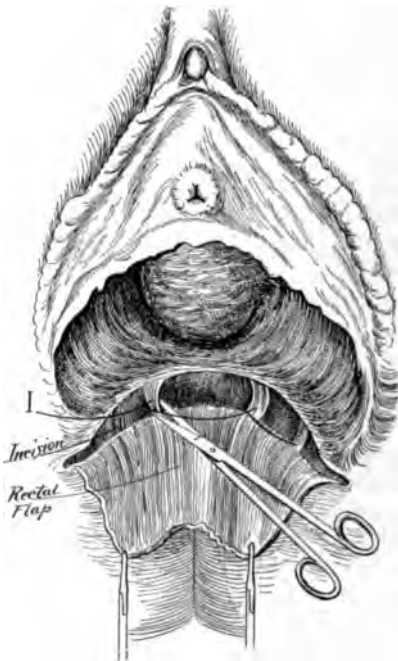


Fig. 58.—When slight traction is made upon the rectal flap, ridges or bands of tissue will form across the line of incision and should be cut as they appear (Noble, in Jour. Am. Med. Assoc., Aug. 9, 1902).

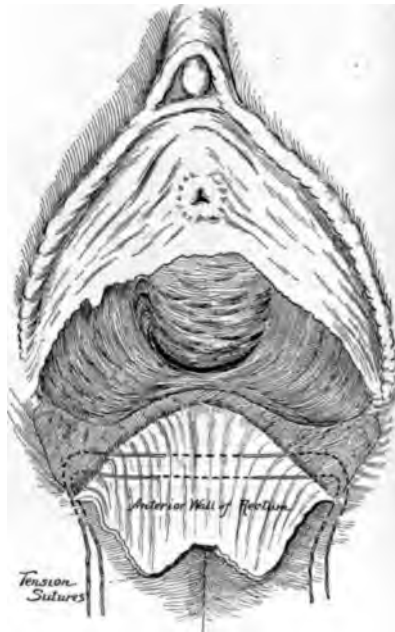


Fig. 59.—Two kangaroo sutures (tension sutures, Fig. 59, and I, Fig. 60) are inserted behind one end of the sphincter muscle deeply into the perineum, embracing a large amount of tissue, then passed across to the opposite side, taking stitches in the thickest part of the rectal flap about its middle portion, carefully avoiding penetration of the rectal mucosa, and returned on the opposite side to the other end of the sphincter ani (Noble, in Jour. Am. Med. Assoc., Aug. 9, 1902).

sarily thinner than the other parts. Carelessness may cause laceration at these points and destroy the main feature of the operation. It is surprising what little cutting will permit extensive sliding of the rectum downward, without dragging upon the vagina. It moves very freely when its lower portion is liberated. The forceps should be left hanging to the flap to hold it in position external to the sphincter muscle. After reaching this stage of the operation there is no longer any necessity for the finger in the rectum. It should be withdrawn, the glove removed, and the hands resterilized. The sides of the perineum are

next denuded and the excess of the vaginal flap cut away. Two kangaroo sutures (tension sutures, Fig. 59, and I, Fig. 60) are inserted behind one end of the sphincter muscle deeply into the perineum, embracing a large amount of tissue; then passed across to the opposite side, taking stitches in the thickest part of the rectal flap about its middle portion, carefully avoiding penetration of the rectal mucosa, and returned to the other end of the sphincter ani (Emmet sutures). In exceptional cases the sphincter muscle may be very much shortened or retracted, and its ends require approximation by buried sutures to secure the best immediate results. When the Emmet sutures are tied, the wound is converted into the condition of a simple perineorrhaphy (II, Fig. 60), and is then closed by some method employed for incomplete tears. Noble prefers closing in layers, bringing together the mucous membrane,

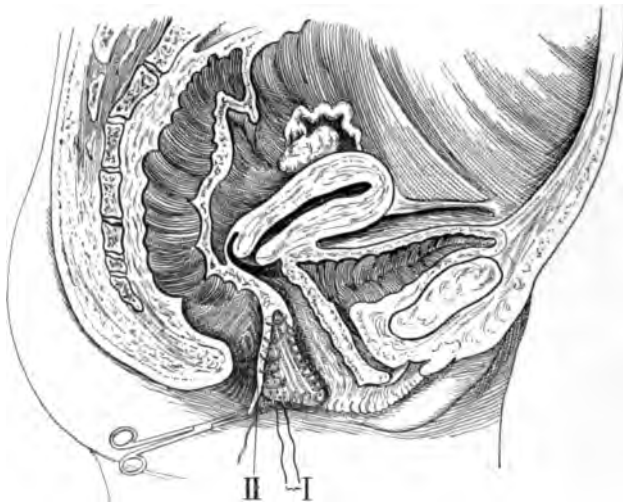


Fig. 60.—Vertical section of Fig. 59, showing tension sutures I, rectal flap II, and whip-stitch sutures closing mucous membrane and skin. This illustration represents closure of the vaginal angle with buried sutures (Noble, in Jour. Am. Med. Assoc., Aug. 9, 1902).

muscles, fascia, and skin in their respective order. This is best accomplished by passing interrupted catgut sutures across the angle from side to side without penetrating the flap. They should be placed about $\frac{3}{8}$ of an inch apart and continued down the crown of the perineum. On reaching the fascia, overlying the levator ani muscle, its edges should be dissected free and approximated by including them in the sutures. The levator ani muscles, deep fascia, and triangular ligaments should be exposed and approximated by buried sutures of small-sized kangaroo. Suturing muscles together parallel to the direction of their fibers adds very little strength to the parts; the object, therefore, in bringing the levator ani muscles together is to prevent the formation of dead space. The remainder of the wound is closed with interrupted sutures passed through the skin and superficial fascia. In addition to this, closely approximating the edges of the vaginal mucous mem-

brane and skin with small catgut whip-stitches, continuing the same down to the mucous flap (Fig. 61) projecting from the rectum, the edges of which are trimmed free of scar tissue, folded together, and closed with the same suture. The sutured flap should be turned forward and anchored over the perineal incision (Fig. 62) with a mattress



Fig. 61.—Whip-stitch closing skin is used to hold the edges of the rectal flap together (Noble, in Jour. Am. Med. Assoc., Aug. 9, 1902).



Fig. 62.—Operation as completed with the protruding rectal flap anchored on to the perineal incision (Noble, in Jour. Am. Med. Assoc., Aug. 9, 1902).

suture of kangaroo to carry it as far away from the anus as possible, with a view of lessening the risk of infection or contact with fecal matter. The kangaroo suture absorbs readily, the rectal flap retracts within the anus and returns to its normal position in 7 or 8 days.

CONDITIONS OF THE CERVIX UTERI.

Cervical Metritis.—This is a very common condition, and the forerunner, as a rule, of trouble higher up in the uterus. A. Doléris¹ concludes an article on this subject as follows: Caustics are efficacious in treating recent ectropions and endocervicitis of superficial character. The strong caustics are not preferable to a series of other topical applications, which are less energetic, more penetrating, and very antiseptic, and which, combined with glycerin, act very rapidly and simply. Such are the essential oils, creasote, tincture of iodine, ichthyol, etc. In treating the scars due to ulceration or cervicitis, caustics of all kinds have only a temporary and doubtful action. Here the knife is very much better, because it removes the diseased tissues as widely and as deeply as is necessary.

P. Petit² remarks that in cases of cervicitis accompanied by the catarrhal plaque containing cysts around the external os, the method of Pouey gives excellent results. The operation is begun by fixing

¹ La Gynéc., Dec. 15, 1901.
29 S

² La Presse Méd., Mar. 22, 1901.

the external os, and at the same time depressing the uterus. Hegar's dilators are used to enlarge the cervical canal, and they are sometimes left in place to act as a guide for the incision. The involved surfaces are encircled by an incision which extends through the mucous mem-

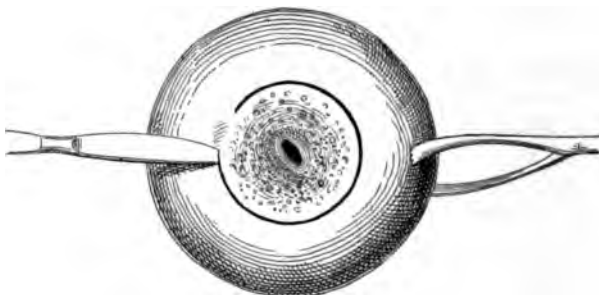


Fig. 63.—Line of incision around the os (Petit, in *La Presse Méd.*, Mar. 22, 1901).

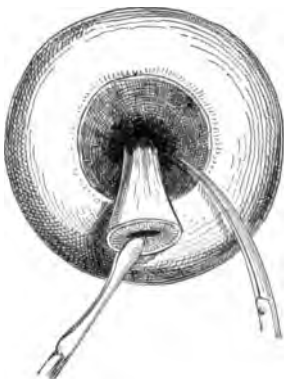


Fig. 64.—Dissection portion of cervix (Petit, in *La Presse Méd.*, Mar. 22, 1901).

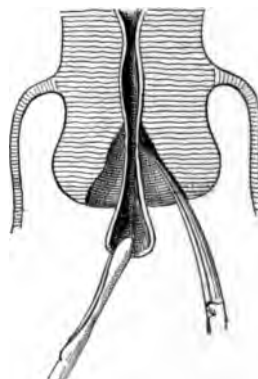


Fig. 65.—Section of cervix showing height of dissection (Petit, in *La Presse Méd.*, Mar. 22, 1902).

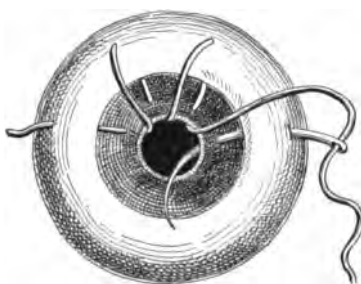


Fig. 66.—Introduction of stitches (Petit, in *La Presse Méd.*, Mar. 22, 1902).

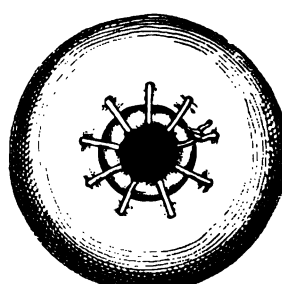


Fig. 67.—The stitches tied (Petit, in *La Presse Méd.*, Mar. 22, 1902).

brane and involves the underlying muscles, extending 2 or 3 mm. up the canal (Fig. 63). The dissection is continued with a pair of curved scissors. The portion that is removed contains all the endocervical glands for the most part, but it rarely extends upward internally to

exceed 2 or 3 mm. As soon as the circular incision is completed, the dissected portion, which includes the mucous membrane, with its glandular structure and a certain proportion of the underlying musculature, is severed at the bottom of the incision (Fig. 64). A continuous suture of catgut is employed, which brings in apposition the severed mucous membrane of the canal and that of the vaginal portion. It is essential that this suture be passed quite deeply, that it include some of the muscular structure, so as to occlude the deeper portions of the wound, and at the same time not to interfere with the accurate coaptation of the edges of the mucous membrane (Figs. 66 and 67).

Amputation of the Cervix.—[The technic of amputation of the cervix has been developed from the original work of Sims and Schröder.] C. P. Noble,¹ in his work, has developed a systematic technic which has given perfect satisfaction for a number of years. If the cervix is moderately hypertrophied and amputation is done for ectropion, laceration, etc., the cervix is split bilaterally down to the sound tissue, the diseased mucosa is removed, and enough of the underlying tissue to make a flap. If the operation is done for procidentia, it is desirable to remove a considerable portion of the cervix, and it is split until the vaginal vault is reached and the broad ligaments are exposed. Each lip is amputated in turn, either with the knife or scissors, the cervix being cut squarely across. The mode of suturing is the same in both cases. Six sutures are used to make a new os. One suture is used upon each side of the os to fasten the vaginal walls firmly to the cut surface of the cervix, and one suture is introduced from each side of the cervix, not only to fasten the vagina to the lateral walls of the cervix, but also to secure the cervical vessels which penetrate the cervix along its lateral borders. These two sutures, when tied, act as ligatures. Of the 6 sutures which are introduced to secure a patulous os, 2 are deep sutures and 4 are superficial.

Tuberculosis of the Cervix.—E. Allerthum² states that frequently tuberculosis of the cervix assumes a great similarity in form to a malign neoplasm and can be differentiated only by microscopic examination of the excised tissue; he gives the history of a case of this kind with a full description of the pathologic conditions shown by the examination. The epithelial growths, above, were superficial; there was a breaking-down of the cells in the neighboring tissues, together with a strong hyperemia and reactive inflammation. In place of high cylindric cells with nuclei at the base, the cells were round, polygonal, or crescent-shaped; the nuclei were in the middle of the cells, varied in form, and were slightly colored. These with other peculiarities left no doubt as to the diagnosis of tuberculosis, which was subsequently confirmed by the finding of tubercle bacilli. In the writer's opinion the significance of the case is that we are in a position to diagnose tuberculosis of the cervix by the characteristic epithelial changes.

H. D. Beyer³ has been able to collect from the literature 69 cases

¹ Am. Jour. Obstet., 1902.

² Centralbl. f. Gynäk., Feb. 22, 1902.

³ Am. Jour. Med. Sci., Nov., 1901.

of tuberculous infection of the uterus below the internal os; 30 of these were postmortem discoveries, associated with far-advanced tubercular lesions, in other parts of the genital tract and distant parts of the body; 2 were postmortem discoveries of primary tuberculosis of the cervix (Friedländer and Kaufmann), 22 were clinical observations alone—of these, 3 were associated with lesions in other parts of the genital tract and distant parts of the body; 4 with lesions in distant parts of the body alone; 6 with lesions in other parts of the genital tract alone, and in 9 the disease was localized to the cervix alone, or it is not stated as to whether other parts were infected. Fifteen cases were observed both clinically and postmortem, all of which were associated with tuberculosis in other parts of the body. The age of the patients was recorded in 57 cases as follows: From 17 to 20 years, 6; 21 to 30, 27; 31 to 40, 9; 41 to 50, 5; 51 to 60, 5; 61 to 70, 3; 71 to 79, 3; showing very distinctly that the disease is most frequent during the period of sexual activity. There seems to be no relation between the character of tuberculosis and the age of the patient. The disease was localized to the portio vaginalis in 19 cases and to the cervical canal in 6 cases. In the remaining 44 cases both the portio vaginalis and the cervical canal were infected. The clinical character of the disease is distinctly divisible into 3 varieties: tuberculous ulceration of the cervix, tuberculous papillary hyperplastic endocervicitis, and miliary tuberculosis of the cervix.

UTERINE ANOMALIES OF DEVELOPMENT.

The Undeveloped Uterus.—Arrest of development of the uterus may occur during intrauterine life, during infancy, or at the age of puberty, says C. L. Bonifield.¹ The cause of the arrest of development is not known. The ovaries frequently share in the lack of development. Sterility usually exists. The pubescent uterus is usually the result of chlorosis, incipient tuberculosis, and typhoid fever. Sharp ante flexion is almost always present. No effect on sexual desire or power of gratification has been observed. Dysmenorrhea is a marked symptom and is of the obstructive type. This usually leads to a chronic congestion which in time leads to hypertrophy and profuse menstruation, so that it is at this period that the patient comes to the gynecologist, and the enlarged uterus often causes him to mistake the real condition. The ante flexion may change to a retro flexion. Unfortunately, nothing can be done when the condition once exists. If the dysmenorrhea be extreme and does not yield to treatment, removal of the ovaries is a perfectly justifiable procedure. The condition is rare, but the percentage would be materially lowered by proper hygiene at the age of puberty. The uterine ligaments play a considerable rôle in cases of faulty development of the uterus, according to D. H. Craig.² The round ligament begins to be important in early fetal life. Its development proceeds *pari passu* with that of the uterus, tubes, and

¹ Am. Jour. Obstet., May, 1902.

² Boston M. and S. Jour., Feb. 13, 1902.

ovaries. Any factor influencing the development of the fetus will influence also that of the round ligament. Experience has shown treatment of faulty prenatal uterine development to be futile. Cases of faulty growth (growth being defined as postnatal change) comprise two classes, as follows: (a) Inhibition or absence of growth; (b) tardy or delayed growth. In the former class the uterus maintains the infantile characteristics of long cervix, small body, and antelexion. In the latter a certain amount of growth has occurred, but at puberty growth has failed; the body of the uterus, however, is as long as or slightly longer than the cervix. In the case of infantile uterus prognosis is very doubtful; in the other class of cases treatment is of value, but must be continued for a period varying from 9 months to 2 years or more. Treatment begun at 15 to 17 years of age promises better results than that which is begun after marriage—say, at 22 years. An important factor in examination is the uterine probe. If the cervical canal in the least exceed that of the body, a most unfavorable prognosis is the only one justifiable. Treatment must be both general and local. Outdoor life, gymnastics, Swedish movements, etc., are indicated. Iron seems to be valuable even when there is no anemia; presumably its action is due to its power to increase the blood-supply of the pelvis. Active and not passive local congestion is required. The ordinary means of obtaining it are intracervical application of impure carbolic acid, negative galvanism, faradism, and hot douches. In obstinate cases discission may be practised; it appears to induce growth, just as a laceration of the cervix causes overgrowth. When growth begins in response to treatment, only to cease after a little while, the retrogression may be due to sagging of the uterus and resulting passive congestion. The indication is plainly to support the uterus from the start. For this purpose Craig recommends a small soft- or hard-rubber retroversion pessary; the smallest pessary that will do the work should be used.

FISTULAS.

Vesicovaginal Fistula.—A. Casamayor¹ presents the following technic for small fistula, which certainly pleads a great deal in its favor: The patient is placed in Sims's position and 4 artery clamps are applied about the margin of the fistulas after the latter have been cleaned of granulations and fragments. The 4 clamps are then seized as retractors and the anterior wall of the vagina is drawn toward the vulva into a funnel shape. While so held, the wall of the bladder is stripped off the vaginal tissue inward toward the cavity of the bladder. This dissection is carried out all around the fistulous opening and upward for 1.5 to 2 cm. When this step has been accomplished, a purse-string suture is passed through the vaginal tissue which is on the vaginal side of the points where the two layers are in normal anatomic relation. While traction outward is made, the purse-string suture is tied and reinforced by one or two interrupted sutures across the opening in

¹ La Gynéc., Dec. 15, 1901.

the stump which then occurs. A retention catheter is then introduced and retained for 4 or 5 days. Casamayor's cases have done exceedingly well under this simple manœuvre. A new method of operating in this condition, with the report of a case, is described by A. L. Smith.¹ The patient presented a tear of the bladder, vagina, and cervix, about 2 inches long, extending from back of the sphincter vesicæ down through the os. The steps in the operation are briefly as follows: After incision of the vagina in front of the cervix, the bladder was pushed back from the uterus, the laceration of the cervix being repaired by Emmet's trachelorrhaphy. The fistula was then cut at the junction of the bladder and vagina. The tear in the bladder was sewed up with catgut (chromicized), the muscular wall only being included, this forming a strong ridge. The vaginal slit was closed with interrupted sutures of silk-worringut, passing through the vagina, then through the muscular wall of the bladder about $\frac{1}{2}$ an inch to one side of the tear, and out on the other side of the vagina, thus displacing the bladder to one side so that the two suture lines did not come together. The advantages claimed are as follows: (1) No stitches are left in the mucous membrane as foci for calculi; (2) instead of a narrow edge for union in the bladder, a thick ridge is secured; and (3) the lines of suture in the bladder and in the vagina are not approximated, a stronger result thus being obtained. Wolkowitsch² reports 8 cases of complicated vesicovaginal fistula which he operated upon successfully by the following method: The cicatricial tissue around the opening is first dissected away; then the cervix uteri is freed and drawn downward, if possible without opening the peritoneal cavity, although this cannot always be avoided. All cicatricial bands are divided until the uterus can be drawn down almost to the vulva. The hemorrhage is not profuse, and it is important not to ligate the uterine arteries. A wide denudation of the vaginal mucosa is made around the edge of the fistula, the anterior surface of the cervix is completely denuded, and the raw surfaces are brought in contact by silk sutures. It is seldom necessary to suture the edge of the vesical mucosa separately. The vagina is then tamponed with iodoform gauze. If the peritoneal cavity has been previously opened, a drain is introduced. In order to drain the bladder thoroughly a suprapubic opening is made sufficiently large to admit the introduction of a small rubber tube, which is sutured to the edges of the bladder wound. Drainage is favored by allowing the patient to lie on his belly, another larger tube being attached to the first and leading to a receptacle, in order to prevent soiling the bed. The writer in recent cases has omitted the suprapubic drainage with equally good results. In the 8 reported cases the functions of the bladder were completely restored, while there were no disturbances caused by fixation of the cervix to the anterior vaginal wall.

Rectovaginal Fistula.—H. N. Vineberg³ recommends a process devised independently by him, A. P. Dudley, and Paul Ségond, the

¹ Phila. Med. Jour., Feb. 15, 1902. ² Centralbl. f. Gynäk., 1901, No. 43.

³ Med. Rec., June 7, 1902.

latter in 1895, for the cure of rectovaginal fistula. It consists in excision of the rectal mucosa to a point beyond the fistula and suturing of the mucous edge to the skin as in a Whitehead operation for hemorrhoids. An excellent result follows this method.

Vesical and Ureteral Fistula following Vaginal Hysterectomy.—Henkel¹ finds that the majority of injuries to the urinary tract occur during operations for cancer of the cervix uteri, rather than of the portio. As shown by Mackenrodt's statistics, the bladder and ureter are especially liable to injury during igni-extirpation, but the clamps have been responsible for many cases. In 263 hysterectomies at the Berlin clinic previous to 1897 the mortality was 5.13 %, while the bladder was injured 7 times and one ureter was injured or tied in 5 cases. After the latter year, when the indications for the operation were extended to include cases in which the broad ligaments were infiltrated, in 357 cases (with a mortality of 5.06 %) the bladder was injured 14 times and the ureter 9 times. The writer finds that these accidents (especially to the ureter) have increased in number, especially when clamps are used. The prognosis in wounds of the bladder is good, about 68 % healing when sutured at the time.

THE URINARY ORGANS.

Gonorrheal Strictures in the Female Urethra.—Imbert² contributes an article on this subject. It is based on 25 cases of stricture which he has collected and from which he deduces that it is impossible for gonorrheal strictures, like those in men, to develop in the female urethra. There is not a single observation on record in which the gonorrheal nature of the stricture is conclusively proved, he states. Before assuming the gonorrheal character of a stricture of the female urethra the possibility of other affections that may induce stenosis must be borne in mind; also of a congenital stricture, spasm, polypus, and cicatrices the results of difficult childbirth or senile stricture.

Polyps of the Urinary Meatus.—According to Leroy,³ these are usually situated on the floor of the urethra about 2 or 3 mm. from the orifice of the meatus. They are derived from the epithelium, from the blood-vessels, from the glands, or from the papules of the urethral mucous membrane. Again, all portions of the mucous membrane may take part in their formation. They may be single or numerous. They occur at all ages, but most frequently between the ages of 20 and 30. The commonest causes of them are blennorrhagia, leukorrhea, irritation from menses, and coitus. The symptoms are dribbling of urine, the sensation of a foreign body in the urethral canal, frequency of micturition, burning and pain during micturition and coitus, bloody discharge, pains in the lower portion of the abdomen and in the groins. The diagnosis can usually be readily made, but when one suspects malignant growth, a small portion may be removed and submitted to micro-

¹ Zeitschr. f. Geburt. u. Gynäk., Bd. xiv, Heft 2, 1902.

² Ann. des mal des. Org. Gen.-Urin., Dec., 1901.

³ Gaz. de Gynéc., Jan. 1, 1902.

scopic examinations. The prognosis is good, but there may be complications, such as cystitis, urethritis, urethrocele, and prolapse of the urethral mucous membrane. Rarely they may become epitheliomas. Various treatments have been employed in their removal, all of which must be operative to procure an ultimate cure. Some tie off the pedicle, others snip them off with knife or scissors and cauterize the base. The most effective method, however, is the Whitehead method for the cure of hemorrhoids. The mucous membrane is separated just as is the pile-bearing area and cut away. The cut portion of the mucous membrane is then brought down and sutured to the orifice of the urethra, where it was previously incised. Interrupted sutures are to be used. Four or five are usually sufficient to get a good approximation.

Primary Carcinoma of the Female Urethra.—Kynoch¹ read a paper on this subject. Winckel classified urethral growths into condylomas, glandular tumors, connective-tissue tumors, angiomas, and epithelial growths. The following notes deal with the last group: The urethra is one of the rarest organs to be affected by carcinoma, the published cases in the female urethra not exceeding 30, and those in the male only about 12. It is difficult to explain why malignant disease of the female urethra is so rare, presenting, as it does, conditions which are supposed to predispose to cancer. Malignant disease of the female urethra was first observed by Robini in 1844, and 2 years later Melchior published 4 cases. He described the condition as being either, first, periurethral cancer, beginning as nodules on the vestibule, and extending along the connective tissue outside the wall of the urethra without necessarily affecting it or its mucous membrane; or, more rarely, a primary urethral cancer, springing from and spreading along the mucous membrane. Winckel proposed the term "vulvo-urethral" instead of "periurethral," because such cases were generally an extension of cancerous nodules originating on the vestibule, and to limit the term primary cancer to those cases originating in the urethral mucous membrane. Secondary cancer of the urethra, although more frequent than primary, is not often seen. Gusserow found that of 311 cases of cancer of the uterus, the urethra was affected only in 56 cases as compared with 128 of extension to the bladder. Doubtless the death of the patient prevented the chance of such extension taking place. Primary cancer of the urethra appears to be rarer than the periurethral form. Deitzer found in 18 cases, 7 primary, 11 periurethral. Bosse found in 25 cases, 20 periurethral and 5 primary. Ehrendorfer in 27 cases found only 5 primary. The primary form has its origin (most frequently) in the epithelium or glands of the urethral mucosa, where it forms either a vascular polypoid growth or a hard, nodulated, sessile tumor spreading along the floor of the urethra toward the neck of the bladder, and eventually by deeper extension producing a urethral vaginal fistula. The vulvourethral (periurethral) form has its origin in the epithelium at the junction of the urethral orifice and vestibule, from which it spreads spirally round the urethral

¹ Brit. Med. Jour., May 18, 1901.

wall, thus differing from ordinary vulvar cancer, which spreads superficially to the adjacent structures, the urethra being seldom involved. It is only in the early stages of the disease that its original form can be defined. Urethral cancer is found at all ages, but is most frequent after the menopause. Of 27 cases collected by Ehrendorfer, 10 occurred between the ages of 50 and 60. Advice is usually sought when there is incontinence of urine or the presence of a tumor at the vulva. Cancer of the male urethra comes sooner under observation because of the earlier and greater difficulty of micturition and the occurrence of cystitis. The diagnosis usually presents no difficulty. The hard breaking-down edges of the dilated urethral orifice, the indurated urethral wall felt per vaginam with the aid of the endoscope, are, as a rule, sufficient. Melchiorj divided urethral cancer into 3 stages: (1) when confined to the lower half of the urethra; (2) when the pelvic fascia and neck of the bladder are involved; (3) when the disease has extended to the symphysis and surrounding parts—a division of importance from the operative and prognostic point of view. Treatment has not given very favorable results. In Ehrendorfer's collection of 27 cases only Winkel and Melchiorj were able to report a case free from recurrence after an interval of 3 and 6 years. Early recognition of the disease, especially before the sphincter becomes involved, is here, as elsewhere, the important factor. Zweifel, Battle, and Goldberg have reported cases in which there was recurrence within 18 months.

Enuresis in Females.—G. C. Parnell,¹ in an extensive clinical practice, has had occasion to treat many obstinate cases of enuresis in females of different ages. He reports 5 cases ranging in age from 9 to 18 years in which he applied a strong solution of silver nitrate to the neck of the bladder. Every case was benefited, and one patient, 18 years of age, who had been a sufferer for 10 years was permanently cured, and 3 of the others had only slight relapses. He used a wire dilator in applying the solution so as to reach the entire length of the urethra. No ointment or oil of any sort is used in its introduction. After the urine has ceased to flow a probe covered with cotton-wool saturated with the solution is introduced between the blades of the dilator and applied thoroughly. The dilator is removed and again reinserted at right angles, and the solution again applied to the surfaces. The strength of the solution should vary from 0.6 gram (gr. x) to 0.3 gram (gm. j) to 30 cc. (1 oz.) of water. Chloroform is not necessary, as the pain is not severe. The patient should be kept in bed for 24 hours and the application repeated in 4 or 5 days if necessary.

Traumatic Granuloma of the Bladder.—[Neoplasms of traumatic origin both benign and malignant are always worthy of attention, especially when they affect such active viscera as the bladder.] G. Kolischer² reports several cases in which granuloma appeared in the bladder of women after injury. His final conclusions are as follows: These tumors are without doubt usually caused by a single severe or a continuous more or less severe injury of the mucous membrane of the bladder. Th-

¹ Brit. Med. Jour., Jan. 10, 1902.

² Centralbl. f. Gynäk., 1902, No. 10.

increase and persistence of these granulomas are probably brought about by the fact that at the time of the injury there was already present an altered condition of the wall of the bladder which acted to prevent a straightforward and easy healing. It is also necessary to notice that it is not sufficient, as a rule, in order to cure these granulomas simply to remove the inflammation of the bladder commonly present, but that it is much more necessary to extirpate the granuloma by an operation. It seems that this procedure can be done with surety through a cystoscope. A good means of avoiding the bleeding essential to such an operation through this small instrument consists in applying a solution of adrenal extract. The results of such operations are usually permanent.

Cystitis, Pyelitis, and Pyelonephritis in Women.—T. R. Brown¹ says that it is most important in the treatment of these affections to arrive at a correct diagnosis. They are always due to infection with some microorganism, of which the colon bacillus is the commonest. In the majority of cases the condition can either be prevented or cured, if its underlying principles are recognized and corrective measures inaugurated. There are certain forms of urinary hyperacidity which simulate closely true vesical infections. The improper treatment of this condition may lead to the development of a true cystitis, with deplorable consequences. In no condition is prophylaxis more essential than in the urinary tract. An absolute diagnosis of renal infection can be made only by urethral catheterization, but in the majority of cases a probable diagnosis may be arrived at by a consideration of the relation between albuminuria and pyuria and by careful cystoscopic examination of the bladder, especially that portion about the ureteral orifice. Contrary to the opinion expressed in the text-books, the great majority of infections both of the bladder and of the kidney are associated with acidity of the urine—that is, are due to organisms which do not split up the urea. In cases of renal infection in which the microorganism has the power of decomposing urea a stone is invariably formed. Thoroughly to understand all cases of cystitis and pyelitis, a careful chemical, microscopic, and bacteriologic study of the urine is absolutely essential.

Drainage of the Bladder in Women.—Kelly² says that in advanced cystitis it is best to begin by draining the bladder for some weeks, and to keep the patient for some hours daily in a bath at 100° F. The patient is put in the knee-chest position, the bladder filled with air through a catheter, the posterior vaginal wall drawn back with a speculum, the knife plunged through the wall $\frac{1}{2}$ inch in front of the cervix, and then, guided by the finger, brought as far forward as desired. The bladder and vaginal linings are stitched together to prevent premature closing. General anesthesia is not needed. Drainage for shorter periods is secured by a $\frac{1}{2}$ -inch hole, in which a mushroom catheter is kept for a week or 10 days. The opening closes spontaneously when the catheter is removed. Kelly uses a special knife with the blade set at an angle on the handle, which is also curved.

¹ N. Y. Med. Jour., Aug. 31, 1901.

² Am. Jour. Obstet., July, 1901.

Removal of the Female Urinary Bladder for Malignant Disease.—

M. D. Mann¹ says the operation for removal of the bladder has not received enough attention in this country, there being very few cases on record. Cancer of the bladder is rare, but is the commonest form of growth found in the bladder. The diagnosis can be made by the symptoms, the use of the cystoscope, palpation, and the examination of the urine. Treatment may be removal through the urethra, through the vaginal septum, or by suprapubic cystotomy. The operations are the removal of the growth and its base; resection of part of the bladder, or cystectomy. The indications for total removal are multiple growths, return after removal; extensive involvement of the base and extension of cancer of the cervix uteri into the bladder. The ureters need no attention at the time of the operation, as by the removal of a portion of the anterior wall they will discharge into the vagina. If possible, the ureteric openings into the bladder should be felt intact. This will rarely be possible. Mann does not believe in ureterointestinal anastomosis. The vagina can be used as a receptacle for the urine, as was done by Pawlik. If this be done, there will be little danger of infection traveling to the kidneys, as the newly made bladder can be kept clean. The operation is done in the Trendelenburg position. The peritoneum over the bladder being cut, the bladder is enucleated by the fingers, and the base, with the anterior vaginal wall still attached, is removed. The uterus is then removed, and the peritoneum closed over the floor of the pelvis. Mann reports 2 cases, both of which recovered from the operation, and has collected from the literature 14 cases more. He concludes that in certain malignant disease of the bladder, total extirpation is a justifiable operation offering no serious difficulties to an experienced abdominal surgeon, and giving the patient a chance for a comfortable continued existence.

Determining the Presence of Stone in the Kidney and Ureter by Wax-tipped Catheters.—

The above method is fully described and fully illustrated by H. A. Kelly.² The wax is made of two parts of dental wax and one of olive oil. The usual posture and methods of ureteral catheterization are employed. Various possibilities of error are fully discussed. The following conclusions are reached: (1) Catheterization of the ureters with a wax-tipped catheter is the most direct means of ascertaining the presence of calculus in the urinary tract; (2) the success of the method depends upon the care and skill on the part of the examiner, together with attention to detail in the preparation of the instrument; (3) the presence of scratch-marks is the most important feature in diagnosis of calculus by this means, but the method affords valuable confirmatory evidences in other ways; (4) in ureteral calculus the method of dilating the ureter and thus inducing the escape of the stone through the natural channel may obviate the necessity for operation; (5) the presence of scratch-marks, if all precautions have been taken, is positive evidence of the existence of calculus, but the absence of scratch-marks cannot be accepted as proof that no stone

¹ Buffalo Med. Jour., July, 1901.² Am. Jour. Obstet., Oct., 1901.

exists; (6) the possible presence of a double ureter, with two openings into the bladder, should always be borne in mind.

Ligation of the Ureters.—Fränkel,¹ from experiments on rabbits, arrives at the conclusion that ligation of the upper end of a ureter after section of the duct does not always prevent the escape of urine from the kidney, as the ligature is apt to slip. Since in exceptional cases it may be possible or justifiable to perform anastomosis of the ureter, it is important to be able to ligate in such a way as to prevent slipping of the ligature. The writer advises that after ligation the upper end be sutured in the abdominal wound. If the urine escapes, the fistula can be cured by a subsequent operation; if the ligature holds and hydronephrosis of the corresponding kidney occurs, the patient still has a good chance of recovery, as is shown by several reported cases. If the opposite kidney is diseased or uremic symptoms appear, the ligature can at once be divided.

Etiology of Movable Kidney.—Watson² conducted a series of experiments on the cadaver to determine the structures chiefly concerned in the fixation of the kidney. Twelve cadavers in which death occurred not longer than 24 hours previously, and in which the kidneys and their surroundings presented no abnormal changes, were used in the investigation. After opening the abdomen downward traction was made by the finger-tips upon the upper pole of the kidney with as little disturbance as possible, to the neighboring tissues. The descent of the organ was from $\frac{1}{2}$ to $1\frac{1}{2}$ inches. The outer leaf of the mesocolon was then divided and the colon and other viscera overlying the kidney were drawn inward. The descent of the kidney under traction was now increased by $\frac{1}{2}$ inch. Next the fatty tissue in front of and beneath the lower end of the kidney was removed, but with no appreciable effect upon its mobility. The removal of that portion of the peritoneum which on the right side forms an actual peritoneal investment of the upper portion of the kidney, and is reflected from it onto the duodenum and stomach, permitted a further descent of $\frac{1}{4}$ to $\frac{1}{2}$ an inch. Thus, after removal of all the structures in relation with the anterior surface and lower end of the kidney, the descent of the organ had not exceeded the lowest point of its normal excursion by more than $\frac{3}{4}$ of an inch in any case. The structures connected with the posterior surface and upper pole of the kidney were now broken down, beginning above the upper pole of the organ. Further descent occurred in direct proportion to the destruction of these tissues, the movement finally becoming entirely free except for the restraint exercised by the main blood-vessels, whose action drew toward the spinal column. These experiments seem to harmonize with the anatomic studies of Gerota and others, and the author comes to the following conclusion: The structures vital to the restriction of the kidney's mobility within its normal excursion are those which form the attachments between the posterior and upper aspect of the tunica propria, and the fascia covering the lumbar muscles

¹ Arch. f. Gynäk., 1902, Bd. LXIV, Heft 2.

² Boston M. and S. Jour., vol. cxlv, No. 12, 1902.

and the peritoneum covering the diaphragm respectively, aided by the less essential ones connecting the anterior surface with the peritoneum overlying it. At the end of a paper, in which he states that from 90 % to 95 % of cases of movable kidney producing symptoms can be relieved by a suitable corset, Gallant¹ recommends a corset as long in front as can be worn, specially made or straight-front corsets being chosen. It must be at least 2 inches less than that formerly worn, and laced at the back from top to bottom as an open V. Having put the corset round the waist, the patient lies down, draws up the knees, pushes the kidney up, and then fastens the corset from below upward, drawing the lax abdominal wall up at each step. Cases not so relieved require nephrorrhaphy.

MENSTRUATION AND ITS DISORDERS.

The Factors which Lead to Variations in the Age of Puberty in Girls.—A. E. Giles² concludes a careful statistical study of the variations in the clinical characters of menstruation and the period of puberty in girls as follows: *The Age of Puberty*: (1) Race has a certain influence on the age of puberty, but is subordinated to the influence of climate. Broadly speaking, a curve of latitudes of different countries from 10 to 66, and a curve of mean annual temperature from 25° C. to 0 ° C., correspond fairly closely with a curve of the age of puberty in those countries ranging from 12 to 17. The mean age of puberty between these extremes—viz., 14.5—forms a kind of “menstrual equator,” and corresponds with the age of puberty in London. (2) Puberty is established earlier in towns than in the country. (3) Among the wealthier classes puberty occurs earlier than among the poor, the middle classes occupying an intermediate position in this respect. Improved mental status has the same influence as better social position. Early sexual relations tend to hasten the advent of puberty. (4) Girls of robust constitution menstruate earlier than the delicate ones. The tuberculous diathesis is associated with late menstruation, and the neurotic diathesis with early puberty. (5) Menstruation is generally established earlier in brunets and later in positive blonds. It is latest in the group of “subblonds,” namely, girls of lighter negative or nondescript coloring. *Clinical Characters of Menstruation*: (1) The periodicity of menstruation is more irregular in those who start menstruating early or late than in those whose first menstruation is from 13 to 17. The greatest regularity is associated with a moderate amount of loss. In the “moderate” group, 11 % are irregular; in the “scanty” and “profuse” groups, 32 %. So also the irregularity among blonds is 32.5 %; among brunets 24.7 %; and in the intermediate grades of coloring, 16 %. Extra work or worry and sexual excitement may antedate the periods. (2) The duration of the flow is directly proportional to the amount of blood lost. (3) The amount of the monthly flow is greatest in those who menstruate early, and

¹ Am. Jour. Obstet., July, 1901.

² Med. Chron., July, 1901.

least in those who start late. When the age of puberty is 12 or earlier, 21.8 % lose little, and 58.2 % lose much. When puberty does not occur till the age of 18 or later, 66.6 % lose little, and 20.1 % lose much. In warm climates menstruation is more abundant than in cold climates. Just as darker pigmentation is associated with earlier puberty, so it is found in association with greater loss. The percentage of those who lose "little" is 39 among brunets, 48 among sub-brunets, 50.8 among sub-blonds, and 55 among blonds; while the percentage of those who lose "much" is 41.9 for brunets, 25.5 for sub-brunets, 25 for blonds, and 16.9 for sub-blonds. After marriage and child-bearing the amount of loss is unaltered in 56 % of cases, increased in 20 %, and diminished in 24 %. Physical fatigue shortens the intervals and increases the pain and quantity. (4) About 35 % of women menstruate painlessly at first. The amount of pain varies with the quantity lost and not inversely. Among those who lose "very little" 40 % have no pain and 28 % have severe pain. Among those with profuse loss, only 16 % are free from pain, and 56 % suffer severely. Pain before menstruation commences is most often sacral; during the flow it is suprapubic. After marriage and childbirth the amount of pain is unaltered in 65.3 % of cases, increased in 20.7 %, and diminished in 14 %.

Normal Menstruation and Some of the Factors Modifying It.—

Clelia Duel Mosher¹ gives in a preliminary note the conclusions arrived at as the result of clinical and experimental study. The first embraced the serial menstrual records of more than 300 women, collectively extending over more than 3000 menstrual periods. The second included laboratory experimental data on the respiration, urine, temperature, pulse, blood-pressure, blood-counts, hemoglobin estimation, etc. Mosher's conclusions are as follows: A rhythmic fall of blood-pressure, at definite intervals, occurs in both men and women. The daily records of the blood-pressure with the sphygmomanometer of Mosso on men and women under similar conditions of life and occupation give curves apparently indistinguishable in character. The fall in pressure in women occurs near or at the menstrual period. In all of the 14 series of records the fall of blood-pressure was gradual from the mean average pressure. This from day to day shows oscillation within rather definite limits. The maximum fall of pressure may extend over 2 or 3 days, and the corresponding rise to the normal average pressure is gradual. There is usually a preliminary rise, above the normal average pressure; this occurs from 3 to 5 days before the onset of the main fall of pressure, which constitutes the principal feature of the rhythm. In every case there was a preliminary fall, abrupt and definite but usually not so extensive as the main fall of pressure; this preliminary fall was followed by a return to the normal or higher pressure before the principal fall occurred. In 4 cases there was a distinct rise above normal after the main fall of pressure before the return to the normal daily oscillations. These variations were not peculiar to either sex. A curve constructed on the subjective observations of the sense of well-

¹ Johns Hopkins Hosp. Bull., April to June, 1901.

being shows ups and downs corresponding to the marked variations in pressure; the sense of maximum efficiency of the individual corresponding to the time when the pressure is high, and of lessened efficiency to the periods of low pressure. The observations were carried on independently of each other. In no case was the change sufficient to incapacitate the individual. The time of low pressure appears to be, in both sexes, a period of increased susceptibility. If symptoms of any kind are shown, they are apt to be given by the point of least resistance. For example, in a man or woman having a tendency to digestive disturbances the symptoms from the digestive tract are likely to occur at the period of low blood-pressure; or when a slight chronic catarrh exists, as so frequently happens in this climate, there may be marked increase of symptoms from the respiratory tract. In women the fall in blood-pressure most frequently occurs before the menstrual flow, the maximum fall being coincident with the onset of the flow; there is a gradual return to the normal mean pressure by the time the menstruation ceases. Occasionally the fall occurred during the flow. While true dysmenorrhea is far too frequent, much of the so-called menstrual suffering is not dysmenorrhea but simply coincident functional disturbances in other organs, induced, possibly by the favoring conditions of a lowered general blood-pressure occurring near or at the time of menstruation. Goodman's restricted definition of menstruation is adhered to—"A periodic sanguineous defluxion from the genital tract." When the attention is of necessity directed to so obvious a process as the menstrual flow, untrained women, especially if without absorbing occupation, naturally refer their lessened sense of well-being and diminished sense of efficiency, which may accompany the lowered general blood-pressure occurring near or at the menstrual flow, to the functions of menstruation. When we remember how firmly fixed is the tradition that a woman must suffer and be incapacitated by this normal physiologic function, it is readily understood how many women would call the depression due to lowered blood-pressure menstrual suffering. All statistics, however extensive or carefully taken, are likely to exaggerate the percentage of women suffering from dysmenorrhea, because the errors just mentioned are so difficult to eliminate.

Age of First Menstruation on the North American Continent.—G. J. Englemann,¹ from a study of this subject, concludes as follows: A careful review of the facts presented shows the exceptional position of American women as to the time of functional development, very much more precocious than the women of other continents in the same region of the temperate zone, more precocious than the peoples from whom they have sprung—an average age of 14 on this continent and of 15.5 in Europe. The present inhabitants of this country are more like the true native American, the American Indian, who matures at an earlier age than the people of any other land in the temperate zone. Then, too, there is but little difference between the extremes in this

¹ N. Y. Med. Jour., Feb. 8, 1902.

country—at most one year, from 13.5 in the girl of highest refinement and education to 14.5, which is the period for the American born of Irish and German parentage among the laboring classes; practically the difference is only 0.5 years, 13.8 among the mass of school-girls to 14.3, the average age for the great body of laboring women. Climate does not appreciably influence pubertal development within the temperate regions of the North American continent; the age of first menstruation is the same (14.3) among the laboring classes in Ottawa, Montreal, Boston, and St. Louis; women of the same class and group attain puberty at the same age, whether in the northern regions of Canada or the warmer climates of the Middle States. Racial characteristics, well marked in European countries, here rapidly fade away, and are barely noticeable in the very first generation. The average American is more precocious than the American born of foreign parents; but the latter, while somewhat later than the girl of American parentage, much more closely approximates her than she does the women of her native country. The difference due to social status, as indicated by the laboring class of the dispensary and the better situated from private practice, is inappreciable—14.2 and 14.3, while in European countries this causes a difference of fully 2 years in the time of pubertal development, frequently more. Climate here has practically no influence; race very little; mentality, surroundings, education, and nerve stimulation stand out prominently in this country as the factors which determine precocity.

Menstrual Eruptions Recurring in Situ.—[Among the rarer phenomena which have been observed to recur in conjunction with menstruation are eruptions, such as herpes labialis, and erysipelas-like eruptions of the face, erythema circinatum on the back of the hands, fugitive erythema elsewhere, and purpura.] At the meeting of the Société Médicale des Hôpitaux of Paris, on May 23d, Henri Dufour¹ described the following interesting cases: A healthy but very nervous married woman, aged 42 years, had at every menstrual period for 5 years an eruption of round nummular erythematous spots which recurred *in situ*. The first spot appeared on the right side of the neck, was exactly circular, and attained the size of a 2-franc piece. It always recurred *in situ* and was accompanied by 5 or 6 satellites, which appeared later. At the last 3 periods a similar spot had appeared at the bend of the right elbow, and at the end of the last period a spot had appeared for the first time on the back of the left hand. After some days the spots gradually lost color. In the intervals between the periods slight pigmentation indicated the sites of eruption, and in some places this disappeared entirely. The spots appeared the day before menstruation. Their evolution occupied 8 days and they were accompanied by considerable smarting. At the onset they were accompanied by malaise, a febrile state, and headache. For some months the patient had noticed a disagreeable odor from the menstrual blood. Vaginal examination was negative. Dufour thinks that the recurrence of the eruption *in situ*

¹ Lancet, June 14, 1902.

is determined by the existence of a previous lesion on which the neuro-vascular phenomena of menstruation act electively. A little further development of the morbid process would cause hemorrhage from the skin, and the occurrence of similar spots on the mucous membranes would probably result in hemorrhage. Hence the case furnishes a key to the explanation of vicarious menstruation, and tends to show that in cases of this phenomenon there is a preceding lesion of the part which is its seat. The disagreeable odor of the menstrual blood in the case related above suggests that the eruption was a toxic effect in connection with menstruation. In the discussion which followed Barié referred to a case of "yellow catamenial chromidrosis," which he had described. Two days before menstruation one hand became painful; then it became covered with large dark brown spots which were especially marked near the middle of the dorsal surface and on the median part of the palmar surfaces of the first two fingers. This phenomenon was so regular that the patient could foretell the appearance of menstruation 48 hours before. The chromidrosis lasted 12 or 24 hours and then disappeared. The right and left hands were alternately affected with perfect regularity.

Reflex Aphonia of Menstrual Origin.—The important changes which take place in the whole body at puberty from the commencement of the functional activity of the genital organs are often appreciable in the organ of speech and phonation, says Niel.¹ It would seem that the development of the vocal cords was dependent to a greater or less degree upon the appearance of sexual activity. The reflex pathologic relations between the two functions exist in men as well as in women, but they are found more often in the latter because women undoubtedly have more genital disorders. These conditions are often found in females at the outset of the menstrual flow, as well as in adult life and at the menopause. Spasm of the glottis, due to a violent congestion of the vocal cords and the whole larynx,—which, however, is transient,—usually lasts but a few minutes, disappearing as rapidly as it comes. In adult life vocal disturbances usually come on at the time for the flow to make its appearance, at times when there is regularity in the flow, whether there is or is not some concomitant pathologic condition in the urogenital tract. The author has seen several cases of this character and finds that it is necessary to treat the local conditions which may run on to chronicity. At the same time a permanent cure of the vocal disturbances can only be accomplished through a most thorough eradication of the disease in the genital tract. The reflex conditions are brought on through both the nervous and vascular systems. Most often there is an intense congestion of the postnatal pharynx, and sometimes there is more or less marked paresis of the inferior vocal cords.

Climate in Menorrhagia.—F. P. Weber² says that in some cases of menorrhagia the congestive tendency in the abdominal viscera seems to be affected favorably by residence at high altitudes. In cases occur-

¹ *Gaz. de Gyn.*, Feb. 15, 1902.

² *Cohen's System of Physiologic Therapeutics*, vol. iv.

ring with chronic congestion and enlargement of the uterus, often due to subinvolution after childbirth or abortion, an extended course of treatment at muriated, muriated alkaline, or sulfated alkaline spas, followed or interrupted by residence at a climatic health-resort of moderate elevation, often gives good results; in these cases, especially, is a prolonged period of rest for the organs required, the congestive tendency being certainly protracted by sexual intercourse. The mere separation from the husband during a residence at a health-resort may have a good effect. The menorrhagia associated with uterine fibroids is frequently favorably influenced by a course of brine baths, such as those of Kreuznach, Woodhall Spa, and Mt. Clemens, in Michigan. In middle-aged women with a tendency to plethora and obesity, treatment at sulfated alkaline spas, such as Franzensbad, with suitable regulation of the diet and regimen, may be recommended, especially when there is constipation, and this should be followed by a stay at some climatic health-resort of moderate or high elevation. When there is cardiac dilation, thermal gaseous muriated baths, such as those of Nauheim, with or without resistance exercises, often are useful; high altitudes are counterindicated. Hydrotherapeutic measures and sea-bathing sometimes are useful in cases requiring tonic treatment; and chalybeate and arsenic spas may be prescribed in certain associations of anemic and debilitated conditions with menorrhagia.

Turpentine in Bleeding from the Uterus.—[The hemostatic properties of the essence of turpentine have long been known, notably through Billroth in 1883, but it is now little used.] A Russian physician, L. F. Lienevitch,¹ has been systematically employing it for 5 years to combat hemorrhages from the uterus. After having opened the neck of the uterus with a dilator, he fixes it with vulsellum forceps and passes into the cavity of the cervix a tampon soaked in a solution containing 1 part of carbolic acid and 3 parts of glycerin, and then proceeds according to need to the further opening of the neck. After this is done he introduces into the cavity of the uterus a mass of iodoform gauze, 5 % or 10 % strength, sufficiently large and long to fill the cavity completely, having previously soaked it in the turpentine. The outer extremity of this piece of gauze is in the vagina, which is carefully cleansed of all the excess of turpentine which runs out during the introduction of the gauze. A vaginal tampon of small dimensions is then inserted and the woman is told to remain in bed for 5 or 6 hours. At the end of that time, when the patient should begin to feel severe uterine colic, the gauze should be carefully withdrawn. In general the bleeding will be stopped in a definite manner, and after a few days a normal mucous and bloody secretion is seen, abundant in quantity. Occasionally it is necessary to repeat this procedure when the bleeding recurs. The author has never seen the least sign of intoxication or any other unfavorable phenomenon follow this method of treatment. The procedure in question has proved itself particularly efficacious in cases of hemorrhage due to interstitial fibromas of the uterus and to inflam-

¹ La Sém. Méd., 1902, No. 17.

matory disease, if the tamponade can be carried out without much dilation of the os. He never yet has employed it in hemorrhage after delivery through fear of an embolism. He also notes the report of another Russian surgeon, M. B. Izatchik, of a case of severe nosebleed which had resisted plugging of the fossas and the internal use of ergot, but which was absolutely controlled by tampons soaked in turpentine.

Lafond-Grellety¹ reports that he has **controlled hemorrhages in the first and last months of pregnancy** by introducing into the vagina tampons dipped in a 10 % solution of gelatin at a temperature of 99° F. In endometritis and metritis with bloody leukorrhea he has arrested the hemorrhage and diminished the leukorrhea, without curing it, however, by injecting into the uterine cavity daily a 10 % solution of gelatin at the temperature of 99° F. and immediately afterward irrigating the vagina with 2 quarts of hot boiled water containing 10 % of gelatin and 10 % of carbolic acid in solution; this to be followed by introduction into the vagina of two tampons saturated with the gelatin solution. This should be retained for 24 hours. Hemorrhage occurring in the course of intrauterine curetment may be reduced to a minimum by continuous irrigation with a hot solution containing 10 % of gelatin and 10 % of carbolic acid. In inoperable cancer of the uterus Lafond-Grellety has controlled hemorrhages and lessened their frequency by means of gelatin tampons introduced into the vagina, care being taken not to injure the pathologic surfaces. In removing the tampons they should first be loosened with a hot gelatin solution, when they may be withdrawn without injury to the diseased parts. After the hemorrhages are stopped vaginal injections of hot gelatin solution should be given 2 or 3 times a week.

Dysmenorrhea.—Theilhaber² calls attention to the fact that a thorough revision of our views on this subject has become necessary in the light of recent experience. In his opinion, more than 75 % of the cases of painful menstruation are not dependent upon anatomic causes. The pain is really due to tetanic contraction of the circular muscle at the os internum, such as occurs in other sphincter muscles in neurotic subjects. He opposes Menge's theory that dysmenorrhea is due simply to an exaggeration of the contractions of the longitudinal muscular fibers, which always accompany normal menstruation. If, he argues, the symptom is due to purely mechanical obstruction, it should invariably disappear after childbirth, which is not the case in nervous and hysteric women. Uterine colic cannot be due only to the passage of clots, since in many typical cases of dysmenorrhea there is a free escape of fluid blood. Moreover, the pains are often most severe from 12 to 24 hours before the flow appears, instead of on the second or third day, when it is most profuse and clots usually appear. Menge³ distinguishes two forms of dysmenorrhea, the so-called idiopathic, which is independent of pelvic disease, and the "secondary," which is due to disease of the genital tract. The writer believes that

¹ Montreal Médical, Aug., 1901.

² Centralbl. f. Gynäk., 1902. No. 3.

³ Centralbl. f. Gynäk., No. 50, 1901.

painful menstruation, from whatever cause, is referable to the tendency to uterine contractions which is present at the time of the monthly period. These are due not only to the premenstrual swelling of the endometrium described by Fritsch, but also to the mere presence of blood within the uterine cavity, which acts as a foreign body. These contractions in healthy women are insensible. In hysteric or neurasthenic subjects, on the contrary, the uterus, though entirely normal, is hyperesthetic, and dysmenorrhea results. Mechanical obstruction to the escape of blood, added to this hyperesthesia, increases the pain. In diseased conditions of the pelvic organs the dysmenorrhea is more pronounced, especially if the two former factors are also present. Hence the deduction: Normal menstruation, as well as dysmenorrhea, is accompanied by pains simulating labor pains, although the latter may be entirely of nervous origin. It follows that local treatment alone is not sufficient to insure permanent relief, but the general nervous condition of each patient must be carefully considered. The writer rejects the theory of a reflex nasal origin of dysmenorrhea. Though he has seen some brilliant results from cocainization of the nasal mucous membrane, he is inclined to regard this as principally an application of the method of suggestion.

Oophorin Tablets for Artificial Menopause.—A. Flockemann¹ has been able to study the effect of ovarian tissue, administered in tablet form, on those symptoms which are due to the removal of both ovaries, in a series of 28 cases, and publishes the results, giving a short account of each case. In 6 cases the symptoms entirely disappeared. In most of these there was flushing, sweating, and giddiness, while mental disturbances were noted in a few. In 4 cases considerable improvement and in 9 others slight improvement was experienced. In one of the last-mentioned group the chief symptoms were mental, and probably were independent of the removal of both appendages for pyosalpinx; the remaining 8 cases were not influenced by the administration. Each patient received at first 1 or 2 tablets 3 times a day for 1 to 2 weeks. In no case was any ill effect to be seen. Although the beneficial effect is not constant, the number of good and fair results justifies Flockemann in recommending that this treatment should be resorted to. He, however, in view of the distressing sensation complained of by the patients after double oophorectomy, considers that one should always endeavor to leave some ovarian tissue behind when performing the operation.

UTERINE INFLAMMATION.

Changes in the Endometrium due to Sclerosis of the Uterine Arteries.—Simmonds² calls attention to the frequency with which minute hemorrhages are observed in the uteri of old women. These are associated with venous thrombosis, sclerosis of the arteries, and narrowing of their lumens. The hemorrhages probably occur just before death, being due to weakened heart action, and have no clinical sig-

¹ Münch. med. Woch., Nov. 26, 1901. ² Centralbl. f. Gynäk., 1901, No. 3.

nificance. Since these sclerotic changes are common between the ages of 40 and 50, it is fair to infer that in many cases climacteric hemorrhages are also due to this cause. Such a condition of the vessels was found by the writer in the uterus of a woman, aged 54 years, which was extirpated on account of obstinate bleeding, the cause of which could not be discovered.

Treatment of Endometritis.—Smylie¹ is still inclined to believe that chronic endometritis is not associated with microbic infection, though the subject is still open to discussion. The relation of abortion to endometritis is fully discussed. The former is no doubt more frequently the result of the latter than its cause; although there can be no doubt that in some cases, especially when aseptic infection occurs, and even without it, the disease results from abortion. Anomalies of the placenta, such as placenta marginata, and succenturia, excentric or velamentous attachment of the cord, hemorrhagic infarction, and placenta prævia are most frequently results of endometritis. It is evident that endometritis which causes severe symptoms in the unmarried, and even those forms which cause only slight symptoms in those who have to bear children, require active treatment. We must appreciate the possibility of preventing the disease by asepsis in midwifery and gynecology, the instruction of those suffering from specific diseases as to risks attending sexual relations, the care of young women during the menstrual period, and the proper treatment of uterine displacements and tubal and ovarian diseases; as well as attention to the action of the bowels, and the health in general. The treatment of endometritis is detailed, which may be summarized as follows: Septic forms require active antiseptic treatment; in those forms of chronic endometritis in which hemorrhage is a prominent symptom, especially when an exact diagnosis is required, the curet is advisable; when leukorrhea is the chief characteristic, or when the curet has failed, a powerful caustic is required, and of those which have proved effectual, zinc chlorid is perhaps the most certain. We may hope in the near future to see it replaced by formalin and atmocausis. Chaleix-Vivie and Kohler,² as the result of a series of clinical experiments with methylene-blue, pure, in concentrated solution and in the form of powder, affirm that it is a valuable remedy in cases of uterine hemorrhage and leukorrhea, and has marked analgesic action in dysmenorrhea associated with disease of the endometrium. It is also useful in cases of disease of the adnexa and old hematocoles. Its bactericidal action has been proved by numerous experiments.

The Douche in Endometritis.—Dudley³ maintains that the good results of the douche will be realized only by the strict observance of the following rules in its application as laid down by Emmet. **Ordinary method of application:** (1) The douche is ordinarily applied with the patient in the sitting position, so that the injected water cannot fill the vagina and bathe the cervix uteri, but, on the contrary, returns

¹ Glasgow Med. Jour., May, 1902.

² La Gynécologie, 1900, No. 5

³ The Practitioner, Aug., 1901.

along the tube of the syringe as fast as it runs in. (2) The patient is seldom impressed with the importance of regularity in its administration. (3) The temperature is ordinarily not specified or heeded. (4) Ordinarily the patient abandons its use after a short time. **Proper method of application:** (1) It should be given with the patient lying on the back with the shoulders low, the knees drawn up, and the hips elevated on a bedpan or rubber sheet, so that the outlet of the vagina may be above every other part of it, when the vagina will be kept continually overflowing while the douche is given. (2) It should be given at least twice every day, morning and evening, and generally the length of each application should not be less than 20 minutes. (3) The temperature should be as high as the patient can endure without distress; it may be increased from day to day, 100° to 105° or 115° or 120° F. (4) Its use, in the majority of cases, should be continued for weeks at least, and sometimes for months. Perseverance is of prime importance.

Atmocausis and Zestocausis.—Pincus¹ reviews this subject in an extended paper in which he emphasizes the value of this method of treatment especially in cases of uterine hemorrhage which have resisted curetment. He affirms that no surgeon is justified in removing the uterus in uncomplicated climacteric bleeding until atmocausis has been tried. It is also of great value in cases of interstitial fibroid in which radical operation is contraindicated. Atmocausis is recommended in menorrhagia with subinvolution, because of its marked effect in reducing the size of the uterus. Pincus² also advocates uterine castration by atmocausis as a means of prolonging life in cases of certain diseases of the lungs or liver producing severe anemia. By this method loss of strength through great menstrual flow or the strain of pregnancy is avoided and life is prolonged. He reports a case thus treated in which an intrauterine application of steam at a temperature of 110° C. for 40 seconds, repeated in 3 weeks for 50 seconds, caused cessation of menses and complete atrophy of the uterus. This result was obtained with little pain, without incurring any danger, or using any anesthesia. Pincus closes the article with the suggestion that this method of producing sterility might be of service to Malthusianism. An objector to Pincus's operation has arisen in the person of Alfred Egon Neumann,³ of Berlin, who does not object wholly to the Pincus procedure, but contends against its employment for the purpose of abolishing menstruation in cases in which the menses are not excessive, and brings up a psychic reason for his contention. He refers to the deep-seated belief prevalent among women that one of the most portentous symptoms that can happen to a phthisical woman is the cessation of the menses; regardless of all medical advice, he says, a consumptive woman who ceases to menstruate will resort to the most hazardous measures to bring back the flow. Why, then, he asks, bring about artificially such a dreadful occurrence as a premature menopause? Instead, he would prefer his own operation for occluding the fallopian tubes, thus producing

¹ Centralbl. f. Gynäk., 1901, No. 16. ² Centralbl. f. Gynäk., Feb. 22, 1902.

³ Centralbl. f. Gynäk., Mar. 22, 1902.

sterility, but allowing menstruation to go on. Koslenko¹ describes the results of his experiments on dogs. Under anesthesia the abdomen was opened, the anterior vaginal fornix was incised, and the cervix was drawn upward so that a tube connected with a steam boiler could be inserted into it. Through an incision in one horn of the uterus a thermometer was introduced into its cavity; at the same time the opposite cornu was isolated from the uterine cavity by passing a silk ligature around it. With a pressure of 0 atmospheres in the steam-kettle the temperature of the uterine cavity rose to 100° C. and remained at that height for 5 or 6 minutes, when it slowly declined. When the pressure was raised to 2 atmospheres, it reached 115° C., but fell in a few seconds. Strong uterine contractions were observed. The uterine muscle after a few seconds became pale, then grayish-red, and finally gray, showing that necrosis had occurred. In a second series of cases uteri were extirpated at various intervals after atmocausis had been used for 20 seconds with a pressure of 2 atmospheres. On the first day partial destruction of the mucous membrane was observed; on the third day the necrotic areas were well defined; on the sixth the dead tissues were thrown off, and on the ninth regeneration of the endometrium had occurred. The deeper portions of the glands were not affected, hence the rapid renewal of the mucosa. By controlling the pressure and the duration of the exposure any desired effect could be obtained, even obliteration of the uterine cavity.

UTERINE DISPLACEMENTS.

Anteflexion.—Kingman² thinks the following operation gives promise of recovery. The procedure is comparatively easy. The result may be accomplished through a short incision by the following simple technic: The patient being in the Trendelenburg position, the bowels are pressed out of the way with gauze and are held back with a broad retractor, which is carried to the bottom of Douglas's pouch. Finding the point of insertion of the ligaments on the posterior uterine wall, this point is seized with a pair of bullet-forceps. Traction is now made and the ligaments are put on the stretch, the body of the uterus being held forward out of the way by forceps. Each ligament is now raised in turn with a blunt hook, and is freely divided near its uterine attachment. Any remaining fibers are felt with the finger and divided in the same manner. For protection against hemorrhage and to avoid denuded tissue in the pelvis the edges of the peritoneum are brought together by a few catgut sutures. The uterus is now lightly suspended by two chromicized catgut sutures through the fundus, according to the degree of flexion. This keeps the divided ligaments apart until they have healed, and so guards against a relapse. Dysmenorrhea and backache are usually relieved in a large measure, if not wholly abolished; bladder irritability, aside from actual cystitis, yields at once; sterility is overcome in a fair percentage of cases, and the progressive endome-

¹ Centralbl. f. Gynak., 1901, No. 17.

² Pacific Med. Jour., July, 1901.

tritis and parametritis are cut short in a much larger number of cases. As for the cases in which pregnancy supervenes, nausea and vomiting, if they occur at all, are certain to be much less severe than would have been the case had the tight ligaments remained to tie back the cervix in the hollow of the sacrum, and they yield readily to local treatment.

Resection of the Uterus for Displacements.—Mauclaire¹ advises the following plan of treatment for persistent anterior or posterior displacements in which there is no disease of the tubes or ovaries requiring their removal. A wedge-shaped piece is removed in the median line from the anterior and posterior walls of the uterus, the portion resected being about 0.5 cm. in depth and the width depending on the displacement to be corrected and extending from the fundus to the vaginal junction. The cut surfaces are brought together with interrupted sutures placed at right angles to the long axis. Very little hemorrhage occurs. It may be necessary to shorten the round ligaments or resect the sacral ligaments in order to insure a complete reduction of the displacement. Preliminary dilation and curettage, and, when needed, repair of the pelvic floor, should be practised in all cases.

Uterine Prolapse.—[This condition is best described as a reducible hernia through the pelvic floor, the sac, which is the inverted vagina, containing uterus, tubes, ovaries, a large portion of the small intestines, the bladder, and the rectum. Disappointing operative results are due to not recognizing that the hernial sac has other contents than uterus, tubes, and ovaries, and that repair of the perineum, removal of a portion of the vaginal wall or even of the uterus, would not correct the greatest difficulty, the malposition of the small intestines. The operation should obliterate the sac.] Wiggin² opens the abdomen, pulls the uterus and with it the vagina upward with bullet-forceps, then passes a needle armed with kangaroo tendon through the uterus about the point of attachment to the round ligament, carrying it up and down the broad ligament in the form of a purse-string suture, the needle emerging about the point of entrance, so that when the suture ends are made taut the broad ligament is folded up and drawn together, and excessive length is done away with, and the uterus has a new point of attachment near the pelvic brim. The same process is repeated on the other side. Four or five weeks later the perineum is repaired. At that time the redundant vaginal walls have practically disappeared. J. Clarence Webster³ has adopted for complete prolapse in old women a procedure which he has found successful in many cases. The uterus is first extirpated and the broad ligaments drawn down as far as possible and fastened into the fornix of the vagina in order to gain the upward traction of these ligaments. Extensive repair work is then carried out. An anterior colporrhaphy is done, removing an oval flap from the anterior wall. Next an extensive colpoperineorrhaphy is performed posteriorly, diminishing the vagina as much as possible in its diameter and building up a new sacral segment of the pelvic floor. The suture

¹ Ann. de Gyn. et d'Obstét., vol. LV, No. 28, 1901.

² Med. Press and Circ., Nov. 20, 1901. ³ Pacific Med. Jour., Jan., 1902.

material used was formalin catgut for the buried sutures, and superficial chromic catgut in the vaginal surfaces. Dührssen¹ now adopts the following method: After amputation of the cervix a transverse incision is made through the anterior vaginal fornix, and a vertical incision is carried downward from the center of the transverse. The vaginal flaps are dissected off laterally, exposing the bladder, the slight attachments of which to the uterus are divided, and the organ is freed as high as the peritoneal fold. The uterus is anteflexed and the fundus drawn down into the wound, to which it is attached in the usual manner with three sutures of catgut or silkwormgut, provided that the patient is not past the age of childbearing. In older subjects it is better to remove a section of the peritoneum in order to secure a fibrous serous adhesion. After excising the vaginal flaps and closing the wound a posterior colpoperineorrhaphy is performed. The patient is discharged at the end of 2 weeks, and is soon able to attend to her usual duties, the uterus remaining in normal position. The writer replies to Gebhardt's objection to vaginofixation, especially the subsequent dystocia which may be caused, by stating that in only one case upon which he has operated has there been any complication during pregnancy and parturition. He calls attention to the most important point in his operation, upon which depends the avoidance of future trouble—either not to incise the vesicouterine fold of peritoneum at all, or if it has been opened, to unite it carefully before tying the uterovaginal sutures. [The operation of vaginofixation, however performed, cannot be recommended in women who are still in the childbearing period.]

RETRODISPLACEMENT OF THE UTERUS.

The Etiology of Retrodisplacements.—An editorial in the "Philadelphia Medical Journal," Jan. 11, 1902, states that an examination of many of the leading text-books of gynecology will show, as the general teaching, that uterine retrodisplacements are most commonly produced by parturition. Admitting that a large, a very large, number of cases do occur after the birth of one or more children with resultant lacerations of the pelvic floor and subinvolution of the uterine body, it is still, we believe, too sweeping a statement to attribute all these cases to the injuries received at childbirth. Indeed, very many badly lacerated perineums are encountered without any associated backward displacement of the uterus, while many heavy and subinvolved uteri maintain a normal anterior inclination for varying periods of time, even reaching to the menopause, when the natural retrograde changes incident to the climacteric induce a normal diminution in the size of the heavy uterus. Again, every large gynecologic clinic will show a great many cases of marked and adherent retrodisplaced uteri in the development of which the ill effects of parturition have taken no part. Such are the cases encountered in young girls, in elderly single women, and also in women in the third and fourth decades, not married. In

¹ Centrallbl. f. Gynäk., 1901, No. 29.

many of the younger women the uteri lie far back in the pelvis, are retroverted or retroflexed, and are often undersized, not heavy, and subinvolved. In this large class of cases some other cause than perineal and vaginal lacerations or uterine and vaginal subinvolution must be sought. An investigation of the clinical histories of these patients will reveal, in a large majority of the cases, two causes quite distinct from parturition—namely, pelvic inflammation and irregularities in the development of the uterine walls. Just as ante flexion of the uterus is produced by a comparative overdevelopment of the posterior uterine wall, so retroflexion, or rather a retroversion, may result from an imperfect development of the same wall. It is not at all uncommon to see in sharply ante flexed uteri an associated retroversion, carrying the organ back toward the sacral promontory, where it becomes subject to the downward pressure of the intestines exerted upon its anterior wall. If such uteri are not soon replaced and held in their normal situation, the retroversion progresses to a retroflexion, and this in turn becomes adherent to the bowel, and a serious form of displacement results. The frequency with which pelvic inflammation following salpingitis results in uterine displacement is now very generally recognized. A gonorrheal infection of the cervix, quickly invading the corpus uteri and the tubes, spreads to the pelvic peritoneum and results in dense adhesions which drag the uterus into the hollow of the sacrum. Even after the inflammatory products in the tubes have been absorbed and these structures have returned apparently to a normal condition, as they not infrequently do, the uterus still remains in its pathologic position, and the patient suffers from one of the most serious affections of the pelvic cavity. Here, then, we find a very prolific cause of retrodisplacement of the uterus. Now, in many of the cases following childbirth, either shortly or at a more remote period, it is not at all improbable that a secondary or superimposed pelvic inflammation is the direct cause of the displacement, without any relationship whatever with the associated peritoneal or vaginal laceration. These two pathologic elements, pelvic inflammatory bands and irregularities in the uterine development, merit prominent places in the determination of permanent posterior dislocation of the uterine fundus, and, in our opinion, should even head the list of causes, with parturition and its ill effects as a less important consideration. H. C. Coe¹ believes that muscular atony is an important factor in the production of uterine displacements.

Anatomy of the Round Ligament.—Sellheim,² from careful dissections in the cadaver, notes several points of practical interest in connection with Alexander's operation. He was always able to find the ligaments at the external ring. Both the mass of fat (mentioned by Imlach) and the nerve are uncertain guides. Within the canal, especially at the middle third, the cord is attached to the surrounding tissues by fibers of muscular and connective tissue. The writer regards an open canal of Nuck as a rare condition. He never found it in any

¹ N. Y. Med. Jour., Nov. 9, 1901.

² Beiträge zur Geburts- und Gyn., Bd. iv, Heft 2, 1902.

of his subjects. The ligaments are longer in nulliparas and thicker in multiparas. In the latter a process of peritoneum is often carried into the canal; less frequently the cord may be cleft. Both of these conditions result from the process of involution following childbirth. To expose the ring he recommends an incision 2 inches long, beginning about $\frac{1}{2}$ an inch inside of the pubic spine, and insists on a blunt section after incising the skin and superficial fascia. No attempt should be made to pick out the tissue at the external ring, for fear of dividing some of the fibers of the ligament. It is not necessary to open the canal.

Treatment of Retrodisplacements.—[The final result of any method of treating disease is always instructive. On account of the rapid progress that surgery has made in the last 25 years statistics concerning it are especially interesting.] H. Andersch¹ reviews the various methods of treating retroflexion and prolapse of the uterus by operation. With special reference to the results obtained, his conclusions are the following: (1) All nonadherent retroflexions, with or without prolapse or descent, should be treated with pessaries whenever possible. (2) Nonadherent retroflexions, which are complicated with prolapse or descensus of even a very small degree, and all cases of prolapse or descensus without retroflexion of the uterus, should be treated by vaginal fixation, if pessaries cannot be worn, and in accordance with the age of the patient. (3) The rare forms of isolated retroflexion of the uterus, with mobility, which cannot be treated with pessaries, must be subjected to either a ventral fixation or an Alexander-Adams operation. (4) All adherent retroflexions of the uterus which require operation at all should be treated by ventral fixation. Dietel² reports 112 cases, in 88 of which the displacement was of long standing. He employed massage and replacement under narcosis as well as surgical treatment. In 32 cases treated by massage 9 were successful. Of 23 in which Schultze's method was employed 20 patients were relieved so that they could wear pessaries, but in these adnexa were not adherent; 21 cases with adnexal complications were similarly treated, but only 12 were successful; 25 patients only were operated upon, the abdominal route being adopted by preference, with conservative treatment of the tubes and ovaries, 22 patients being cured. Hysterectomy was not performed in any instance.

Operative Treatment.—The present operations for this condition, such as Alexander's hysterorrhaphy, and ventrosuspension, are considered transitional by J. M. Baldy,³ so that he has devised the following operation to meet all the requirements of the condition: The round ligament on each side of the uterus is picked up and a ligature is thrown about it close to the uterus, so placed as to secure the artery. The round ligaments are then severed close to the ligatures. This leaves the uterine ends of the ligaments free and bleeding. The hemorrhage is controlled by a fine ligature applied to each bleeding vessel, or by

¹ Arch. f. Gyn., Bd. Lxv, Heft 2, 1902.

² Centralbl. f. Gynäk., 1901, No. 28.

³ Am. Jour. Obstet., May, 1902.

the sutures which fasten them in the next step of the operation. A pair of forceps is then made to perforate the broad ligament from its posterior aspect (at the point at which the round ligament is cut on the anterior surface), and the cut end (the pelvic end) of the round ligament is grasped in the bite of the forceps and pulled through the hole in the broad ligament (made by the forceps in perforating) until it protrudes on the posterior side of the broad ligament. The opposite side is treated in a similar manner. The cut ends of the round ligaments are then attached to the posterior aspect of the uterus at the cornua, directly back of the original site of the attachment of the round ligaments on the anterior aspect of the uterus. The point of attachment may be higher or lower than this, as may be necessary to accomplish the desired result. As much of the round ligaments may be cut off as is necessary to produce the proper position of the uterus. Thus the uterus remains a pelvic organ and has no artificial supports. It is free to expand in pregnancy and there are no adhesions to give trouble from pain or possible strangulation of the bowels.

Schwartz¹ prefers **intraperitoneal shortening of the round ligaments** to hysteropexy, although 9 out of 63 patients on whom he performed the latter operation subsequently bore children. He regards it as a more scientific procedure, less apt to be followed by trouble during pregnancy and parturition.

Stankiewicz² believes that every case of retroflexion during the period of sexual activity should be **treated, preferably by pessaries**, though he notes only 3 cures in 109 cases. Surgical intervention offers the best prospect of a permanent cure. He prefers the method of intravaginal shortening of the round ligaments, recommended by Bode and Wertheim, with some modifications. In 27 cases 87.5 % were successful. The advantages over the Alexander operation are: (1) The avoidance of hernia; (2) both ligaments may be shortened through a single incision; (3) the ligaments can invariably be found; (4) the method is applicable to cases of adherent retroflexion; (5) diseased adnexa can be treated at the same time; (6) the results are entirely satisfactory; (7) there is no visible cicatrix or subsequent pain. On account of the disastrous results which sometimes follow fixation of the uterus to the anterior abdominal wall, especially during pregnancy and labor, numerous methods have been devised to allow a certain degree of mobility and yet suspend the uterus in its normal position. The Alexander operation is difficult, requires considerable training, and makes no provision for the bound down uterus, which is the one usually requiring interference. D. T. Gilliam³ has devised an operation which he believes proves efficient. An incision 3 inches long is made in the median line, the adhesions are broken up, and, with the finger behind the broad ligament, the round ligament is caught up at a point $1\frac{1}{2}$ inches from the uterus and a thread passed around it. The other ligament is similarly treated. The skin and subcutaneous tissue are

¹ Transactions of the Thirteenth International Medical Congress.

² Ibid.

³ N. Y. Med. Jour., Jan. 4, 1902.

retracted from the fascia and muscular layers of the abdominal wall and a perforation is made through the fascia and muscular layers, beginning $\frac{1}{2}$ an inch from the wound and passing downward and outward into the peritoneal cavity. Forceps are passed through the opening, and by means of the thread the round ligament is drawn out and through the perforation and stitched to the fascial layers. The uterus is thus not fixed, but rests easily and naturally against the bladder, and varies in position with the condition of that organ and the rectum. The normal course of a pregnancy is in no way interfered with.

Topography of the Uterus and Bladder after Alexander-Adams Operation.—The assertion that the uterus occupies its normal position after the Alexander-Adams operation is at variance with the observation of Bulius.¹ Examination after such operation shows the uterus almost horizontal, the fundus above the pelvic inlet, it may be 5 to 6 cm.; the portio vaginalis, as a rule, directly above, or in front of, the spinal line and on a level with the lower rim of the pubic symphysis. The position of the portio depends largely upon the rigidity or relaxation of the sacrouterine ligament and the vaginal wall. The shortening of the round ligaments does not give normal conditions; it brings the uterine fundus forward, yet it does not bring the entire uterus into a normal anteversioflexion, but into a horizontal position. The evidence, however, that the round ligaments, after being shortened, retain their functional capacity, appears of the greatest significance in view of any subsequent pregnancy, and it is probable that the usual pregnancy changes take place, and growth and distention of the uterus can go on unhampered.

FIBROID TUMOR OF THE UTERUS.

The Etiology of Fibroid Tumors.—E. Stanmore Bishop² remarks that many theories in regard to the etiology of uterine fibroids have been advanced by various writers, all of which are based upon observations of specimens. Some believe that they are the result of the late development of embryonic structures. Cambernon, among the older writers, believed that myoma originated from an infertile ovum which, from some cause or other, was obstructed in its passage and became blocked in the uterine tissue. Ricker described distinct epithelial relics in the tumors which he believed were remains of the primitive epithelium of Müller's duct. Max Voigt detected distinct glandular structures in two myomas. Hauser and Diesterweg traced these glands to Müller's duct; Nagel and Breus to the wolffian duct. Von Babes found true epithelial growths in the interior of the uterine myomas, and von Recklinghausen traced them to the wolffian duct. The latter also found similar growths in the wall of the fallopian tube, and believed that these also sprang from the wolffian duct. Meyer found glandular structures in the muscular tissue of the uterus in the adult and in newborn children. These structures, sometimes acinous, sometimes tubular,

¹ Centralbl. f. Gynäk., Jan. 18, 1902.

² Brit. Gyn. Jour., Feb., 1902.

were histologically identical with the endometrium. The majority of fibromyomas, however, do not show any internal glandular structures. Other writers, therefore, take quite a different view of the origin of the tumors. Virchow, for instance, regards them as a hyperplasia of previously existing muscular fibers. Senn, on the other hand, regards them as the result of the development of a matrix of myoblasts existing independently of pre-existing muscular fibers between which the tumor arises. Mary Dixon Jones¹ believes that they have their starting-points in the inflammatory products of the organ, and Gallippe and Landouzy discovered spherical cocci which they believed to be the original cause of the growth. A view which has received wide acceptance of late is that which ascribes the starting-point of uterine fibromyoma to the overdevelopment of the outer walls of certain uterine arteries or arterioles. Pilliet, Klebs, Meslay, and Hyenne accept this view. Kleinwächter, Roesger, and Gottschalk differ only as to the relative size of the arteries involved, the first attributing it to changes beginning in the smallest, Roesger to those which possess an adventitia, and Gottschalk to the larger arteries. Kleinwächter says that there are in the tiniest myomas blood-vessels hardly larger than capillaries; these are surrounded by round cells which, he believes, change into spindle cells, and these, finally, resemble perfectly organic bands of muscle-fiber. Costes claims that the myoma depends for its development on the capillary vessels in whose adventitia embryonic cells are formed which give rise to the formation of the smooth muscle element. Gottschalk describes sections showing arteries with abnormally thick walls. Bishop inclines to this theory of the origin of the tumors, but admits that it has by no means met with unqualified acceptance. Möller disputes the conclusions of Roesger and Gottschalk. Santi² has carefully studied the researches of previous investigators in regard to the origin of myomatous tumors of the uterus, and has made many microscopic examinations of myomatous uteri. He points out that the presence of many tortuous and spiral arteries about a myoma is not now believed to have the important bearing upon the tumor which Gottschalk was inclined to give it, nor is Keiffer's observation that certain vessels are found in them deprived of the adventitia of very much importance; he believes, however, that Roesger's demonstration of the different origin of the muscular fibers of the uterus and those of the vessel-walls is of great value. Myomas are found chiefly in the uterus, tubes, ovaries, vagina, dartos, intestine, and prostate, but pre-eminently in the uterus. He asks, Is this due to the capacity of the uterine muscular fibers to increase in size and number during pregnancy? Costes found some small nodose elevations in the muscular walls and made them the origin of myomas. Santi remarks that these nodules, which have not been observed by any one else, were most probably due to the faulty methods of staining. Kleinwächter and Müller found that the capillaries always terminated in the muscular facet, and this is taken as proving the origin of the muscle-cells from the vessel-walls, but

¹ Med. Rec., Feb. 16, 1902.

² Ann. di Ostet. e. Gin., April, 1901.

Santi believes that the facet of muscle-fibers is simply some protoplasmic prolongation which precedes the true formation of the capillaries, and that they finally become muscular fibers. Santi objects to Roesger's view that the arrangement of the fibers about the vessel is a proof of the origin of the myomas from the muscular coats of the vessels; he believes that it is a proof to the contrary, because there are more circular than longitudinal fibers in the vessel-walls—and therefore the myoma arranges itself against the prevailing tendency of the fibers of the vessel-wall. Tribondani believes the myoma fibers are developed from the muscular coat of the arteries, and Gottschalk thinks that the myoma grows from a large and tortuous artery which is often found several times in one section. Santi, however, points out the presence of tortuous and spiral arteries as normal in the uterus. Claisse, finding some vessels presented swollen and deformed endothelial cells, with local changes in the vessel-wall about this spot, holds that these changes are the early phases of myoma formation in the uterus. Santi states that he has found no fact to convince him that myomas arise from the vascular tunics or that they form exclusively within the latter; he is inclined to believe the contrary—namely, that myomas arise from the uterine muscle-fibers owing to the peculiar characteristic of aberration of these muscular fibers. He finds the groups of deeply stained muscle-cells in the uterine wall to be the young newly formed nuclei of myomas. These groups often have no relation to the vessels; the small capillaries and vessels often found in them can be recognized as newly formed vessels. The lumens of such vessels are always irregular and present swollen and projecting endothelial cells. He has never seen any tendency to obliteration of these vessels, even when the growth is all about them. The absence of elastic fibers scattered among the tissue of the myoma is one of the strongest facts against the origin of myomas from the vessel-walls, in which such fibers are very abundant.

The Uterine Changes in Fibromyoma.—E. Stanmore Bishop¹ calls attention to the changes which are noted in uteri the seat of fibromyomatous tumors. He states that Semb in 23 cases found that no definite characteristic changes in the mucous membrane could be determined. Wyder, in 1878, claimed that the endometrium was converted into diffuse adenoma, and, in 1887, he reported 20 cases in which he found interstitial endometritis. Campe found in 10 cases chronic glandular endometritis, with inflammatory changes in the stroma in one case. Borisoff examined 21 uteruses and found in the endometrium removed from the site of the tumor atrophy with complete or partial destruction of the glands in 11 cases, glandular endometritis in 3 cases, interstitial endometritis in 5 cases, and glandular and interstitial endometritis associated in 2 cases. In 2 cases of subperitoneal tumor the entire endometrium had atrophied, and in another there was glandular and interstitial endometritis. In many of the preparations every form of endometritis was to be seen. In a greater number of cases beneath the superficial portions of the endometrium

¹ Brit. Gyn. Jour., Feb., 1902.

the blood-vessels were very much dilated and filled with corpuscles. A diffuse extravasation was seen in all sections, most marked in the superficial endometrium, but sometimes extending into the muscular wall. In most of the sections the superficial epithelial cells had disappeared. Barreman finds in these cases, according to Bishop, that while the deeper layers of tissue in the endometrium show a glandular change, the more superficial present the microscopic appearances of an interstitial endometritis. The glands invade the subjacent muscular layer, and may even invade the myoma. This hyperplastic form of endometritis is the rule; the mucosa is seldom atrophied except where it is strongly compressed by fibromyomatous nodules. Bishop, from his own microscopic examinations, concludes as follows: The presence of a fibromyomatous growth in the uterine tissue has an effect upon the endometrium lining the uterine body. In the early stages, and while it is still intramural, it tends to produce hyperplasia of the endometrium when becoming sufficiently submucous to exert some pressure upon the membrane, it produces compression of the glands, with subsequent disintegration both of them and of the interglandular substance; when actually polypoid into the uterine canal, the endometrium over the actual mass and the opposing uterine wall is reduced to a single layer of cells, which becomes progressively thinner in proportion to the pressure exerted, and approximates the squamous type. In many of the sections blood-vessels and lymphatics are seen immediately below, or within a very short distance of the projecting line of epithelium. Bishop remarks that one practical result of such observations is as follows: The use of the curet for the purpose of checking hemorrhage would seem to be justified in those stages of the disease which occur before the tumor becomes polypoid. In the later stages, when the endometrium over the tumor and opposed to it has been reduced to a mere line of epithelium, its removal can do no good, and may have very evil results by laying open lymphatics and permitting the entrance of microorganisms.

J. H. N. Knox¹ reports a case of **lipomyoma of the uterus**. (See Plate 6 and Fig. 68.) Upon microscopic examination the tumor was found to be composed largely of fat-cells inclosed in a supporting substance composed of smooth muscle and connective tissue in varying proportions. Considerable areas made up of connective tissue and muscle tissue and containing no fat-cells were found. There were no evidences of fatty degeneration. Knox has been unable to find any similar case reported in the literature. A lipoma in this situation is also of interest, because, as there is no fatty tissue whatever present normally in the uterus, a lipoma of this organ lends support in a limited way to Cohnheim's theory as to the histogenesis of tumors. Cullen states that in a systematic examination of over 600 myomas, this is the only case of this character found. In nearly every myoma hyaline degeneration is found, and he has encountered three specimens in which the centers of the myomas contained sarcomatous tissue.

¹Johns Hopkins Hosp. Bull., Oct., 1901.

PLATE 6.



Lipomyoma of the uterus, natural size. The uterus has been longitudinally bisected. The left half is shown. The posterior wall is seen to be the seat of a large globular tumor, presenting on cross-section the irregularly lobulated appearance described. This is due to the inclosure of fat-cells by trabeculae of firmer tissue. The tumor is rather sharply demarcated from the surrounding uterine wall, which is everywhere thinned, the portion between the growth and the cavity being particularly affected. Near the superior limit of the cavity is a sessile uterine polyp seen in cross-section (Knox, in Johns Hopkins Hosp. Bull., Oct., 1901).



The Calcification of Uterine Fibromyomas.—Guibe¹ calls attention to the frequency with which calcified fibromas are discovered at autopsies on old women, and their rarity in patients under 40 years of age. He remarks that subserous and interstitial fibromas far more commonly undergo calcification (4 in 5) than submucous and polypoid growths, probably because the latter are more efficiently vascularized. In 80 % to 95 % of the cases the calculus is composed of tribasic calcium phosphate, while in from 5 % to 15 % it is composed of calcium carbonate and rarely of calcium sulfate. The almost constant absence

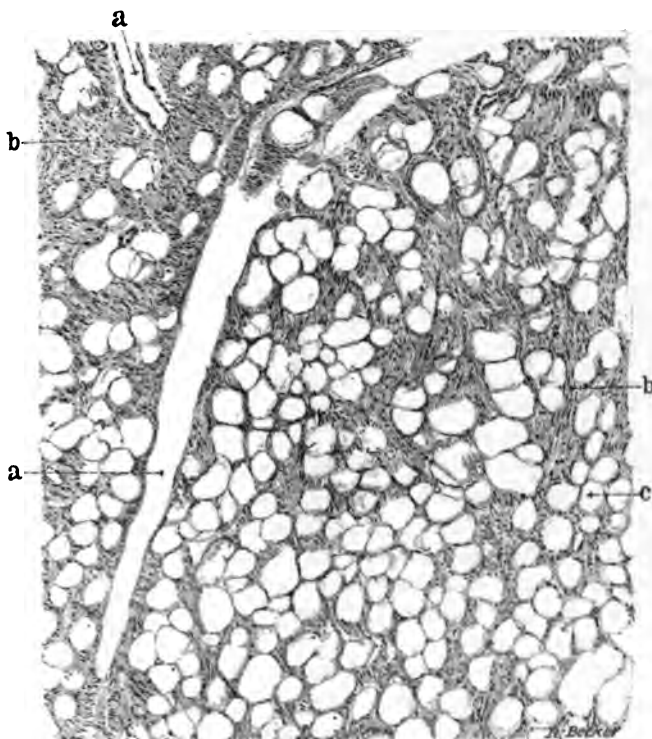


Fig. 68.—Lipomyoma of the uterus (50 diameters). The section consists of a network, "b," composed of nonstriated muscle-fibers and connective tissue in varying proportions. The interspaces, "c," are fat-cells. At some points they are very abundant, at others isolated. "a" are blood-vessels. Sections from all parts of the tumor present essentially the same appearances (Knox, in Johns Hopkins Hosp. Bull., Oct., 1901).

of magnesium ammoniophosphate forms a remarkable and characteristic difference from the renal and vesical calculi. The symptoms of calcification are often obscure, and differ little, if at all, from those of an ordinary fibroma. In the majority of cases, however, pain, compression, and discharge will characterize the condition. The pain varies in intensity, is sometimes slight, sometimes agonizing, and radiating to the loins, the anus, perineum, external genitals, and inferior extremities. The symptoms of compression may vary from those of a unilateral

¹ Ann. de Gyn. et d'Obstet., July, 1901.

sciatica to those of a paraplegia; there may be edema from venous compression, and interference with micturition and defecation from pressure upon the bladder and rectum, and occasionally ulceration and perforation into the latter cavities. The discharge may be hemorrhagic, mucous, or purulent, and may contain fragments of calcified products, the latter condition being pathognomonic of calcification. As regards treatment, the condition may in elderly women generally be left to nature. Should intestinal obstruction or peritonitis occur, or should the symptoms of compression increase, hysterectomy should be performed without hesitation, unless after dilation of the uterine canal a submucous calculus should be found so loose as to be removable by means of the curet. Hegar¹ reports 7 cases of combined carcinoma and fibromyoma of the uterus. The capsule of the fibroid seems to oppose a certain barrier to the advance of the cancer. As soon as the capsule has been destroyed the malignant disease spreads rapidly through the fibromuscular tissue. Only 2 cases have been recorded in which epithelial ingrowths developed in the center of a fibroid, nor were they clearly demonstrated as evidence of actual malignant degeneration of the benign tumor. It has not been proved that the presence of fibroids favors the development of cancer. The expressions "myo-carcinoma" and "cancerous degeneration" of a fibromyoma should be discarded.

Pregnancy and Labor after Myomectomy.—West,² on the basis of a comparatively large number of instances now recorded in which pregnancy and labor have occurred after the enucleation of fibroids from the uterus, advocates myomectomy as a legitimate and conservative procedure. He reports a personal observation in which 9 incisions had been made in the uterine tissues in order to remove 16 tumors varying in size from that of a hen's egg to that of a pea. Each incision was closed by chromicized catgut, and the slight subsequent hemorrhage was controlled by hot compresses and some superficial sutures. The patient conceived 22 months after the operation and was delivered of a male child weighing 7½ pounds after a normal labor of 12 hours. West quotes a number of other cases, in 2 of which blood or amniotic fluid escaped through a fistula in the abdominal wall. All the children were born healthy. Chenieux³ draws attention to the difficulty of diagnosis in some cases of pregnancy complicated by tumors. He states that it is possible for fibromas reaching up to the umbilicus to pass unnoticed until the patient becomes pregnant. Moreover, a cyst reposing in the small pelvis might by the development of the gravid uterus be pushed up into the abdomen, when the strain on its adhesions or the torsion of its pedicle might lead to symptoms of peritoneal inflammation resembling those of a ruptured extrauterine pregnancy. Berthomier insists on the necessity of operation upon large fibromas as soon as pregnancy is established. Thumin⁴ has collected all the cases

¹ Centralbl. f. Gynäk., 1901, No. 27.

² Med. Rec., Aug. 17, 1901.

³ Before the Fourteenth French Congress of Surgery, in Paris, Oct. 25, 1901.

⁴ Arch. f. Gyn., Bd. LXIV, Heft 3, 1902.

of pregnancy and labor complicated by the uterine myomas published since 1885, and finds that the mortality of abdominal total extirpation for this condition has been 8.9 %, and that of supravaginal amputation 11 %. Total extirpation avoids subsequent catarrhal and malignant (15 reported cases) disease of the cervical stump, and affords better drainage. He reports 3 cases of the enucleation of myomas during pregnancy with normal labor at term, and 6 cases of total abdominal extirpation with 1 death.

Fibroids of the Cervix Uteri.—Lewers¹ states that this variety is much less common than those arising in the fundus uteri. They may, however, be interstitial, subperitoneal, submucous, or occur as polyps. The importance of interstitial fibroids in this situation is largely a matter of size; a large growth when it has reached the size of a cocoanut should, in the author's opinion, be removed; pressure is likely to produce trouble in the ureter and some disorder of micturition. An important point in diagnosis is to recognize the difference between a submucous fibroid of the cervix or body which is felt through the dilated os uteri and a fibroid of the cervix which is truly interstitial. In the former case, of course, the tumor may be safely removed by morcellement through the vagina, whereas an attempt to remove a large interstitial fibroid of the cervix in that manner would almost certainly be disastrous. One of the difficulties met with in removing these large cervical fibroids is found in the fact that the uterus with the tumor is practically fixed, and by no means can be drawn up out of the pelvis, however long the abdominal incision be made. As regards the treatment of the stump, it is the author's plan in an ordinary abdominal hysterectomy for fibroids, when the cervix is not involved, to dissect out a cone-shaped piece of the cervical mucous membrane and then to pass sutures through the anterior and posterior walls of the stump and tie them as tight as possible. In cases, however, of interstitial fibroid of the cervix the wall of the cervix from which the tumor has been removed is very thin, and the opposite unaffected wall has also become very thin owing to stretching as the tumor grew. In his first 2 cases he tied these thin cervical walls together so as to shut off the vagina; an alternative method is to merely pass ligatures through each cut edge of the stump independently when it is necessary to control bleeding, leaving the communication with the vagina wide open and drawing the ends of the ligatures through the cervical canal into the vagina.

The Preservation of the Ovaries and Functionating Uterine Tissue in Hysteromyomectomy.—Beyea,² with the view of saving healthy ovaries or parts of ovaries, together with a sufficient quantity of the uterine body to provide a mucous membrane which can perform the functions of menstruation, instead of amputating the uterus at the level of the floor of the pelvis, carries his incision through the body of the uterus as far up as is consistent with complete removal of the fibroid growths. (See Fig. 69.) This operation is, of course, only

¹ Brit. Med. Jour., July 13, 1901.

² Am. Jour. Obstet., Sept., 1901.

applicable to those myomas which destroy the upper three-fourths, two-thirds, or less of the uterine body, and when the tubes and ovaries of either side are normal. Beyea would employ it whenever possible in women under 40 years of age.

Ultimate Results of Operations for Uterine Fibroids.—Burckhard¹ finds, from an analysis of the statistics of a number of operators that with few exceptions the results of myoma operations are quite satisfactory. After castration hemorrhage usually ceases if all the ovarian tissue has been removed; the tumor ceases to grow and usually diminishes in size. Menstrual molimina rarely persist after the removal of both ovaries, but may do so if one ovary is left, even if the uterus is re-

moved. When the entire uterus is removed with or without adnexa, disturbances are less frequent than after castration and supravaginal amputation; if the ovaries are left, they are still more rare. He has never observed profound psychic disturbances after the removal of both ovaries. Since no injury to the health results from the presence of the ovaries after hysterectomy, and climacteric phenomena are less marked, they should always be preserved when they are healthy.

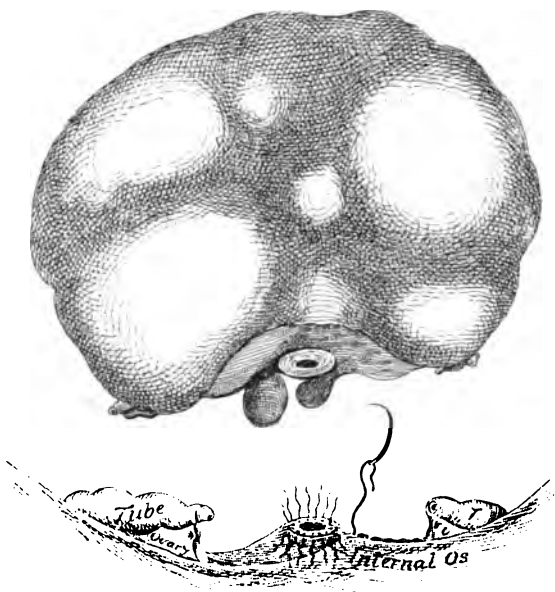


Fig. 69.—Preservation of the ovaries and tubes in hysteromyomectomy (Beyea, in *Am. Jour. Obstet.*, Sept., 1901).

Median Section of the Uterus.—Küstner,² of Breslau, calls attention to the value of median section of the uterus, a procedure already of frequent application in operations by the vaginal route, as applied to the removal of myomas by abdominal incision. In dealing, for instance, with a large spherical interstitial myoma, which extends well above the navel, it is unnecessary to carry the abdominal incision clear to the upper limit of the tumor. The incision may terminate below the navel, and be carried, after opening the abdominal walls, directly into the tumor, so that it divides the capsule and penetrates several centimeters into the myoma itself. Then vulsella forceps are applied, first to one side of the incision and then the other, and thus generally

¹ *Zeitschr. f. Geburts. und Gyn.*, Bd. XLIII, Heft. 1, 1902.

² *Centralbl. f. Gynäk.*, Nov. 2, 1901.

one half and then the other of the myomatous uterus may be brought outside of the abdomen. This procedure enables the operator partially or completely to enucleate the myoma either before or after the uterus is brought outside the abdomen, according to convenience, or he may proceed to complete section of the uterus, according to Krönig's

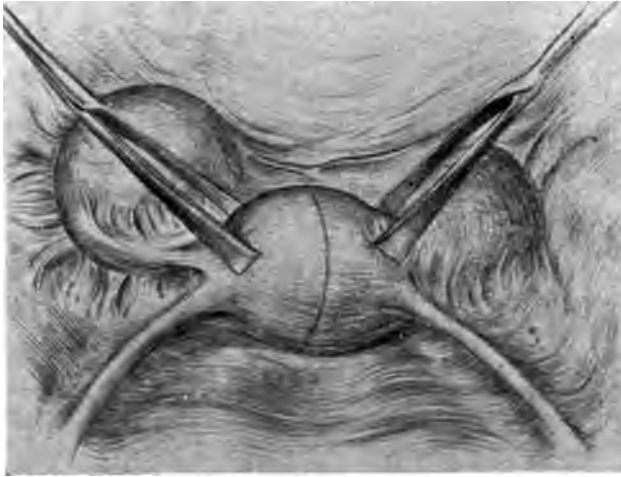


Fig. 70.—Richardson's method of bisecting the uterus (Amer. Med., April 26, 1902).



Fig. 71.—Richardson's method of bisecting the uterus (Amer. Med., April 26, 1902).

suggestion, as a preliminary to extirpation. The advantages claimed for this procedure by Kelly, Küstner, and Döderlein influenced Krönig¹ to adopt and use it in 32 cases with satisfactory results in 31 and 1 death. Injuries to the bladder, ureters, and intestines occurred in no

¹ Centralbl. f. Gynäk., Jan. 18, 1902.

case, and the loosening of strong and extensive adhesions was much facilitated. His experience justifies the claim of Döderlein that the hemisection of the uterus had essentially reduced the number of injuries to adjacent organs which are associated with total extirpation of the uterus and adnexa. At first Krönig thought to limit the use of this method

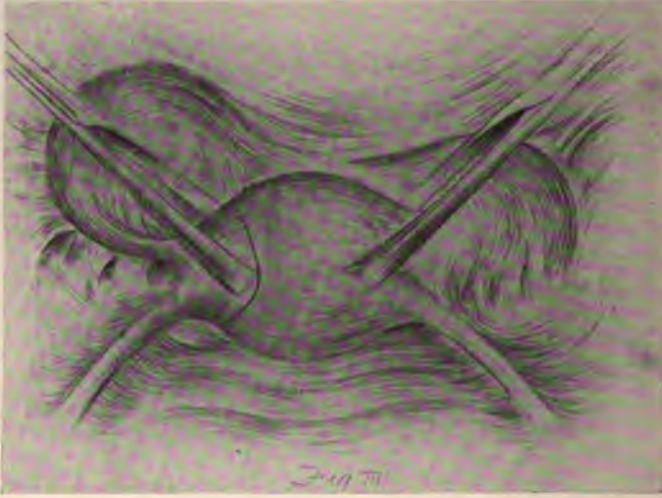


Fig. 72.—Richardson's method of bisecting the uterus (Amer. Med., April 26, 1902).



Fig. 73.—Richardson's method of bisecting the uterus (Amer. Med., April 26, 1902).

to cases of enlarged myomatous uterus, or homocentric myoma, but he is now convinced of its advantages under other conditions, such as pedunculated myoma or extirpation for climacteric hemorrhage. After splitting of the uterus, the ligation, or suturing, of the broad ligament

and parametria can be done more readily in smaller sections and with more certain and satisfactory results.

C. H. Richardson,¹ in a well-illustrated article, describes the technic of median and partially median section. His illustrations are appended. (See Figs. 70-73.)

MALIGNANT DISEASE OF THE UTERUS.

Extension of Uterine Cancer through the Lymphatics.—Puppel² publishes the result of his histologic studies in this field. He found that in cancer of the portio vaginalis those lymph-spaces are first affected which run in the middle muscular layer. The disease then extends either to the vagina or through the lymphatics to the parametrium. Metastases in the body of the uterus occur late, after the broad ligaments have been affected, and also through the medium of the lymph-spaces in the middle and outer muscular layers. As a practical deduction from these observations the writer recommends that supra-vaginal amputation be performed in old women in cases of operable carcinoma of the portio. If the posterior lip is involved, he advises extensive removal of the parametric tissues. If the disease has extended as high as the os internum, total extirpation is necessary. Coudray³ concludes an extended paper on this subject by expressing doubt as to the advisability of extirpating glands which are apparently healthy, the cancerous growth being in an incipient stage. Glands which are enlarged and nonadherent should always be removed; if adherent, their ablation is usually fraught with danger to the patient. Theoretically, exposure of the open lymphatics favors fresh infection; but practically there is yet no method of operation which avoids this danger. He suggests what he calls the "sclerogenous" method, which aims at closure of the lymphatics in the neighborhood of the tumor by making numerous injections of chlorid of zinc around the growth. He reports a case of scirrhus of the breast in a woman, aged 58 years, 5 years after treatment by this method. Nothing remained of the original growth but a small, hard nodule. Five years later the cancer had recurred, with enlargement of the axillary gland. He infers that in a certain class of cases the growth of circumscribed cancer can be arrested for a long period by the artificial production of fibrous tissue around the growth, which causes obliteration of the lymphatics. This treatment is especially applicable to patients who refuse a radical operation.

Cancerous Inoculation.—[Recurrence of carcinoma by pure inoculation has always been a disputed question, with the affirmative evidence, although slowly, yet probably surely, accumulating.] The following summary of what appears to have been such a case is given by R. Schaeffer⁴ in these succinct terms: (1) The case was one of recurrence in the abdominal parietes, after a total extirpation of the uterus by the abdominal route along with the manifestly involved large lymph-

¹ Amer. Med., April 26, 1902.

² Centralbl. f. Gynäk., 1901, No. 13.

³ Rev. prat. d'Obstét. et de Gyn., No. 9, 1901.

⁴ Zeitschr. f. Geburts. u. Gyn., 1901, Bd. XLV, Heft 3.

channels and nodes. The retrograde recurrence in or about the remnants of the genital appendages did not occur, although that would be the site and the manner one would reasonably expect. (2) The extirpated organs, especially the ovaries, and the recurrence in the parietes showed alike adenocarcinoma. (3) The recurrence in the abdominal wall was also the only one discoverable clinically and by microscopic examination at the time of the operation. Segments removed there showed that it was developing entirely anterior to the deep fascia, having left the peritoneum entirely intact. (4) The removal of the brittle, broken-down mass appears to have been the source of direct cancerous infection. Metastasis is much more common after vaginal than abdominal operations. It is rare in the cicatrix after laparotomy; first, because spontaneous metastases seldom or never occur here, and, secondly, because the course of the lymphatics of the ovary is such as to render such metastases improbable. The reported cases of inoculation in the abdominal cicatrix may be divided into 4 classes, viz.: (1) Recurrence of benign neoplasms after the removal of similar tumors of the ovary. (2) Development of carcinoma following the removal of malignant ovarian growths. (3) Carcinomatous degeneration of the cicatrix accompanying nodules in the peritoneum. In these cases there is probably direct extension of the disease. (4) Cancerous recurrence in the abdominal cicatrix after the removal of cancerous ovaries, the peritoneum being healthy (as in the writer's case and 4 others). [In the first two classes one may infer the development of the secondary growth in consequence of inoculation of the abdominal wound during the operation, though they furnish no positive evidence in favor of the inoculability of cancer.]

Etiology of Uterine Cancer.—[Since efforts in the treatment of uterine cancer have hitherto been so discouraging, it is reasonable to hope that the so-called parasitic theory of the origin of cancer may involve some radical improvement in this direction.] In the pathologic laboratory of the State of New York, Gaylord¹ has reported that he has found the protozoon of the disease. Whether this theory will stand the test, time alone will determine. Can a cure for cancer based upon the blastomycetic or protozoic theory of its origin be more improbable than the cure of diphtheria was considered before the introduction of antitoxin? Gaylord, Adami, and others have been working in this direction, but until they have determined whether they have found parasites, or only products of cell-degeneration, we must remain in doubt. Gaylord injected cancerous tissue into the jugular vein of a dog, which died 22 days afterward, with a distinct cancer in the lung. He also found that the so-called cancer-protozoon and vaccine bodies developed alike when injected into the cornea of a rabbit. In his experiments Gaylord uses the fluid from the peritoneal cavity of patients operated upon for cancer, and from this obtains a pure culture of the protozoon in its hyaline form. One hundred animals were inoculated by him, and the same organisms were recovered from different

¹ Jour. Am. Med. Assoc., No. 19, 1901.

organs in every case examined. In 12 animals distinct cancers were found. Too much of the material produced death in the other animals from acute cancerous infection. Sjoebning has made a medium of human fat, on which the protozoon grows; when this is injected into animals, cancer results. According to J. P. Ryan,¹ the house-distribution of cancer in Buffalo shows an area of remarkable concentration in the German wards. He finds that cancer is much more frequent among the foreign-born than among the native-born, and is particularly common among the Germans. For instance, in Buffalo the cancer-rate of foreigners is 4.59 times the cancer-rate of the native-born. Cancer of the uterus and cancer of the breast in Germans is little more than half as frequent as cancer of those organs in the native-born, while cancer of the stomach is ten times as frequent. Van De Warker believes that there are cancer belts in the country as well as cancer houses, and that in some sections of the country hysterectomy gives better results in favor of recurrence and of the prolongation of life than it does in other sections, even though the operation were performed by the same men or men of equal skill. For instance, in the region of western New York, with a belt through central New York extending into the Hudson River valley, there is the greatest prevalence of cancer. Mann,² in the same discussion, stated that there are several well-recognized cancer belts in the United States as well as in Germany. There is one particularly, of which Buffalo is the center, extending down from Canada, in the neighborhood of Toronto, toward Pittsburg. In that belt there are more cases of cancer, according to the United States census, in proportion, than in many other portions of the country. Sutton remarked that it has been proved that cancer is more prevalent along the streams, which of course occupy the valleys. The women of the Highlands of Scotland are freer from cancer than those of any other class.

Pathology.—E. Ries,³ in an interesting article on the recent developments of our knowledge of cancer of the uterus, remarks that it is a generally accepted truth that carcinoma of any portion of the body spreads, as a rule, along the lymphatics. Until 1895 it was known that cancer of the uterus progressed along the lymphatic vessels in the uterus as well as the broad ligaments and the appendages, but its spread to the regionary lymphatic glands was either denied absolutely, or, it was stated, did not occur until the case had reached the final stage. Since that date it is well recognized that in order to insure any remote success in operating upon uterine cancer, all of the regionary glands must be extirpated. The anatomy of the lymphatic glands which drain the cervix uteri has been worked out in recent years by Poirier, Peiser, and Bruhms. These glands are located in the broad ligaments, along the internal, external, and common iliac vessels, over the obturator foramen, and on the anterior aspect of the sacral bone. Ries remarks that it is not always an easy task to find cancer in the glands. When

¹ Jour. Am. Med. Sci., June 7, 1901.

² Am. Jour. Obstet., Aug., 1901.

³ Am. Jour. Obstet., July, 1901.

the entire gland is not involved, it is utterly impossible to tell with the naked eye where to look for cancer, and nothing remains but to examine a series of sections. In order to make absolutely sure that there is no cancer, it is necessary to cut all the glands in complete series and to look through all of them. Ries, in one of his cases, was compelled to look through 700 sections before he found one with cancer. He remarks that a good many investigators did not go to so much trouble, and their results are therefore useless if they were negative; as, for instance, those of König and von Franque. Again, if only one or two glands had been removed and found free from cancer, this does not prove the absence of the disease. The size of the glands, their hardness, and their color may be suggestive, but they are never full evidence. Enlarged glands may not contain any cancer, and apparently normal sized glands may be full of cancer nests. The carcinoma found in the glands is a faithful reproduction of the original carcinoma of the uterus—that is to say, it is squamous-cell carcinoma when the disease in the cervix is a squamous-cell carcinoma, and it is of the columnar type in the glands when the carcinoma in the cervix is of that type. When the carcinoma originates in the body of the uterus and extends downward so as to involve the cervix, metastases of the type of cancer of the body occur in the glands which drain the cervix, as in a case described by Cullen. When carcinoma of the body is limited to the body, the glands draining the cervix may be free. The cancerous lymphatic glands may break down in their centers, and they then contain a grumous mass. This mass may become purulent, and thereby an abscess may be formed surrounded by a shell of carcinomatous gland tissue. This abscess may burst into the peritoneal cavity, giving rise to peritonitis and death of the patient after the patient has recovered from hysterectomy. Enlargement of the glands has been observed by a number of investigators without the presence of cancer in the gland. In these cases the enlargement, as a rule, is associated with a septic ulcerated process in the cancerous growth, which under the microscope presents the appearance of a hyperplastic process. Glands have been found cancerous when they were no larger than normal glands. Large glands may contain only hyperplastic glandular tissue, or cancerous tissue, or a mixture of both. The size of the cancer in the cervix is in no regular proportion to the size of the affected glands. Thus, in one of Ries's cases the cancer of the vaginal portions was not larger than his thumb-nail, but the largest cancerous growth was larger than a pigeon's egg. The cancerous glands are sometimes firmly adherent to the large blood-vessels, especially the veins, and the adhesions may be so firm that in the attempt to remove them, the blood-vessel is torn into, as has happened in cases in the hands of Werthiem, Funke, and Ries. This firm attachment of the glands to the blood-vessels is probably due to cancerous invasion of the vessels. What was formerly diagnosed as infiltration of the broad ligaments may simply be a large cancerous gland in the broad ligament. Neither the number nor size of the involved glands can be predicted from the size of the cancer

in the cervix. The majority of the glands cannot be felt without opening the abdomen, even if they are involved. Even after the abdomen is opened it is necessary to split the peritoneum over the large blood-vessels and to dissect these free in order to see and remove all the glands.

Prognosis of Cancer of the Uterus.—Baldy,¹ in a paper before the American Gynecological Society, remarks that carcinoma in any part of the body is so well known for its virulence that there can be no surprise at the results of this disease recently reported from so many sources when the uterus is the organ attacked. He admits that carcinomas of the same variety are intrinsically much the same as far as the disease itself is concerned, but the location of the disease renders the practical aspect of the case widely different. Of all portions of the body in which it is safest for cancer to occur, the fundus uteri is that portion. It has been said that practically all cases of cancer of the cervix eventually die of the disease, and that practically all cancers of the fundus remain well if operated upon. This statement, he believes, is more generally true than one would suppose at first glance. It has been his own experience and that of other surgeons that less than 5 % of cases of cancer of the cervix are cured, no matter what line of treatment is followed. Baldy has encountered 24 cases of cancer of the fundus; of these, 3 were either too far advanced for operation or refused operative treatment. In the remaining 21 cases hysterectomy was performed by the vaginal method, the abdominal method, or the combined vaginoabdominal method. Two of the 21 cases died of the operation. Of the 19 remaining cases, all are alive and well with 2 exceptions. One of these died of pneumonia 7 years after the operation; the reports from the other case would seem to indicate a recurrence. From these statistics the fact stands out strongly that about 75 % of the fundal cases are well and free from signs of cancer, as against 5 % or less of cancer of the cervix.

Treatment of Inoperable Cancer of the Uterus.—Torggier² has abandoned the use of dry powders, preferring peroxid of hydrogen. He reports 260 cases of inoperable cancer treated by tamponade of the vagina with iodoform gauze saturated in pure hydrogen dioxid, which is left *in situ* for 3 or 4 days. After the removal of the gauze as much of the diseased tissue as possible is removed with the sharp spoon, the raw surface is cauterized, and is then covered for a few minutes with cotton soaked in 40 % solution of formaldehyd. Within from 6 to 10 days a slough is thrown off, leaving a dry wound.

Operative Treatment of Uterine Cancer.—[The operative treatment of carcinoma of the uterus is still claiming a great deal of attention, and was discussed both at the German Surgical Congress at Heidelberg and at the Gynecological Congress at Giessen. The great majority of the speakers were in favor of vaginal hysterectomy rather than of abdominal hysterectomy.] Winter pointed out that 134 radical abdominal operations had been performed with a mortality of 24.6 %, 18 of the deaths occurring from infection and 12 from collapse. At

¹ Am. Jour. Obstet., Aug., 1901.

² Münch. med. Woch., 1901, No. 30.

the Berlin Clinic before 1892, 28.7 % of all the cases were operated upon and 33 % cured, or 9.5 % of the whole. At the present time as many as 48 % of all cases underwent operation; and if the relative proportion of the cases cured was maintained, it would amount to 16 % of the whole number. At the present time the bulk of German opinion appears to favor the views largely held in England—that very good ultimate results can be obtained by vaginal hysterectomy, and that it is so far doubtful whether they are likely to be improved upon by the adoption of the radical abdominal operation, with its immediate high mortality. Mackenrodt¹ favors removal of the glands and intervening tissue in all cases, whether the glands are enlarged or not. The method which he adopts consists in a long transverse incision above the symphysis, curving downward slightly. The recti muscles are separated from the pubis, and the peritoneum extending above the bladder is detached nearly to the umbilicus. A transverse incision is then made through the peritoneum just above its attachment to the bladder, the round ligaments and ovarian arteries are ligated and divided, and the peritoneal flap from the anterior abdominal wall is then carried above the uterus and sutured to the peritoneum of the posterior wall, thus making the uterus extraperitoneal. He then detaches the peritoneum at each side of the uterus and frees all tissues out to the pelvic wall, including glands and connective tissue. The unopened raised peritoneum covers the spaces that are left, and they are drained. The uterus is then separated from the bladder and rectum, and the vagina is clamped and divided below the clamp by the thermocautery. The extraperitoneal cavity which is left is drained through the vagina. By this method, he claims, the entire pelvic contents are removed without opening the cancerous mass. Amann² also describes a transperitoneal operation which he preceded by vaginal disinfection for several days. He makes a median vertical incision with transverse extensions just above the symphysis. The steps of his operation are division of the round ligament, isolation of the ureter, ligation of the uterine artery, and separation of the bladder from the uterus and vagina. The peritoneum is then opened as in Mackenrodt's operation, the infundibulopelvic ligament is divided, and the peritoneum closed as in that operation. The left parametrium is dissected out, the uterus removed through the vagina, and all enlarged glands in the pelvic cavity removed. Amann has performed 5 of these operations with 1 death. Olshausen³ believes that when carcinoma has extended beyond the cervix, thorough removal of the glands and the parametrium is impossible. For carcinoma of the cervix or body in the early stage the vaginal operation is preferable; in the advanced carcinoma of the cervix, or when there is a large size of the corpus uteri, the abdominal operation should be employed in order to permit the removal of the glands as well as the hypertrophied organ. Wertheim⁴ favors the abdominal operation and removes the entire parametrium with the

¹ *Centralbl. f. Gynäk.*, No. 27, 1901.

² *Centralbl. f. Gynäk.*, No. 25, 1901.

³ *Centralbl. f. Gynäk.*, No. 25, 1901.

⁴ *Centralbl. f. Gynäk.*, No. 25, 1901.

glands. He states that involvement of the broad ligament is no contraindication to the operation provided the patient is in a suitable condition. The less radical the operation, the better are the immediate results and the poorer the permanent results. He agrees with others that complete extirpation of the glands is impossible. Latzko¹ insists upon catheterization of the ureters in order to escape injuring these structures during the process of hysterectomy. Hofmeier holds that total hysterectomy is not always required in order to obtain a permanent success, but that for carcinoma for the vaginal portion, supravaginal amputation of the cervix is sufficient. In support of this he quotes Winter's statistics, which show a difference in permanent results of nearly 3 % in favor of the amputation as proposed to total extirpation of the uterus. Jordan² would perform abdominal hysterectomy only when total vaginal hysterectomy cannot be chosen. He believes that radical removal of the glands is impossible. Winter remarks that in selected cases the incomplete operation is practically radical. None of the present methods absolutely excludes the possibility of recurrence from implantation of the cancer-cells. He is not yet sure whether the abdominal or the vaginal operation is preferable, but he favors the vaginal route for cases in which the neoplasm is confined to the uterus, and reserves the abdominal operation for those cases in which the parametrium is involved.

In his paper on the **status of hysterectomy for uterine cancer**, C. A. Kirkley³ remarks that the objection to vaginal hysterectomy for cancer is based not so much upon its primary as upon its remote results. From an operative point of view it is alluring. So little shock attends it; it is so rapidly performed in skilful hands; so little pain follows; and convalescence is usually so rapid, that it appeals to some as the only proper procedure. Based strictly on surgical and practical principles, however, nothing could be more irrational. While epithelioma is yet limited to the portio vaginalis, and before there is lymphatic extension,—which, according to Kelly, does not always occur in the earlier stages of the disease (according to Roger Williams, in 71 %),—the progress of which is often arrested at the internal os uteri, it would seem unnecessary to remove the healthy uterine body, and it would seem useless to do so if both cervix and body were disintegrating, and the adjacent tissues and organs were involved in the destructive process. Adenocarcinoma of the cervix, which most rapidly extends to the surrounding structures, is rarely seen early enough for a radical operation of any kind. This fact is proved by the frequent, and in most cases early, recurrence. Adenocarcinoma of the body of the uterus is the only form of cancer in which vaginal hysterectomy would seem clearly indicated, if seen early, when, according to Kelly, it is usually localized and shows but little tendency to involve the cervix or parametrium. That Kelly, Coe, Goff, Wiley, Boldt, Janvrin, and others have made excellent records in vaginal hysterectomy cannot be denied. Yet as a general mode of practice it has been disappointing

¹ Ibid.² Ibid.³ Am. Gyn. and Obstet. Jour., July, 1901.

and discouraging. According to Pryor, the average of primary mortality was 10 % in 1078 cases by operators in Germany, France, England, and America. Byrne found a mortality of 14 % in 1273 cases. Cullen, in his recent work on "Cancer of the Uterus," reports the ultimate results in 61 cases of squamous-cell carcinoma of the cervix in which either vaginal or abdominal hysterectomy or the combined method had been performed. The primary mortality was 14 % (9 cases; 3 died or gave unmistakable evidence of return), and in January, 1900, 21 % (13 cases) were alive and still well. In 4 cases the operation was abandoned. According to Pryor, in vaginal hysterectomy for cancer of the body of the uterus Kukenberg found 66.7 % without recurrence after 5 years, Lewers 83.3 % after 2 years, and Jessett 60 % after 6 years. [These authentic reports, from both an opponent and an advocate of vaginal hysterectomy for cancer, contain little to recommend the operation except for adenocarcinoma of the body, the only condition in which vaginal hysterectomy is clearly indicated. Early recurrence is the rule, in all other varieties, and that life in the aggregate is prolonged or made more comfortable by any radical operation would seem more fanciful than real.] B. C. Hirst¹ prefers the combined method of hysterectomy for several reasons. It enables one to make a clean and neat operation in every way. It is possible to inspect the pelvic glands and to remove them if necessary. The operation has none of the disadvantages of the vaginal hysterectomy, and the woman's convalescence is much more satisfactory in every way. Baldy does not believe it is possible roughly to remove the pelvic glands no matter what the route adopted; and if they are not thoroughly removed, the attempt is useless.

Sarcoma of the Uterine Cavity.—[This condition is not so rare as is generally supposed. This is because it is microscopically confounded with myoma and fibromyoma, and a great number of these tumors are taken out by hysterectomy and cast aside as such, without the formality of a microscopic examination.] According to A. Marien and O. Normandin,² sarcoma of the uterine cavity is more rare than epithelioma, and more rare than the other varieties of uterine cancer which occur as a result of the degeneration of fibromyomas just before or during the menopause. These tumors may also be mistaken for hydatidiform mole when pregnancy coexists. Such being the case, the diagnosis from the clinical standpoint is often rendered somewhat difficult.

AFFECTIONS OF THE PELVIC ORGANS.

Epithelium of the Fallopian Tube.—Voinot,³ from careful studies of the anatomy of the tube, arrives at the conclusion that ciliated epithelium is present both before puberty and after the menopause. Before puberty cilia are most often found at the pavilion, less often at the ampulla, and often at the ampulla and isthmus, especially between

¹ Am. Jour. Obstet., July, 1901.

² Gaz. de Gynéc., Mar. 15, 1902.

³ Thèse de Paris; La Gynécologie, June 15, 1901.

the folds. After the menopause they are found only at the ampulla. During the period of sexual activity cilia are most numerous, but are disposed in groups, being found most constantly in the depressions between the folds.

Apparent Abdominal Tumors.—Einhorn¹ found enlargements of the abdomen in 42 out of 6045 patients examined by him, which were not due to neoplasm. These were situated in the epigastric or hypochondriac regions, and are included by the writer under 4 classes—viz., prolapse of the left lobe of the liver, thickening and prominence of the abdominal aorta, localized hypertrophy of the muscles of the parietes, and probable adhesions around the lesser curvature of the stomach. These are distinguished from true neoplasms by their smooth surface and more sharply defined outline. The site of the enlargement gives some clue as to its possible character. There is normally marked enteroptosis in the conditions before mentioned, while the history of each case shows that it is of long standing.

Etiology of Hydrosalpinx.—Pompe Van Meerdervoort,² reporting a case in which a large hydrosalpinx developed in a patient aged 54 years, 5 weeks after confinement, explains its occurrence by the theory that the hyperemia of the pelvic organs preceding the climacteric leads to an increase of the normal secretion of the tubal mucosa. In consequence of the subsequent senile involution of the tube its epithelial lining is lost, the opposite surfaces adhere, and the abdominal ostium is closed so that the contained fluid cannot escape and a hydrosalpinx results.

Retrouterine Hematocele.—Lewinsohn³ gives the results of a study of 11 cases, in only 4 of which was the hemorrhage clearly due to tubal abortion. In one the blood came from a ruptured varicose vein on the surface of an ovarian cyst, but in the remaining 6 no cause could be assigned. Eight patients recovered without operation, the blood becoming entirely absorbed. The writer states that Winckel never incises a retrouterine hematocele, and has never lost a patient in consequence of this conservative treatment. Kober⁴ reports 2 cases of celiotomy for supposed ruptured ectopic gestation, in both of which extensive retrouterine hematoceles were found. In both instances the tubes showed absolutely no evidence of gestation, and were clearly not the seat of the hemorrhage. In the first case it was probably due to excessive coitus; in the second to a violent muscular effort. The writer does not approve of operation in the case of the old hematoceles which tend to become absorbed.

Primary Carcinoma of the Fallopian Tube.—Boursier and Venot,⁵ in reporting a case of this rare condition, state that 31 have already been recorded. The ages of the patients varied from 40 to 60 years. The menopause does not seem to be an important factor in the development

¹ Berl. klin. Woch., 1901, No. 43.

² Nederl. Tijdschr. v. Verlosk. en Gyn.; Centralbl. f. Gynäk., 1901, No. 13.

³ Inaugural Diss., abstract in Centralbl. f. Gynäk., 1901, No. 38.

⁴ Centralbl. f. Gynäk., 1901, No. 39.

⁵ Rev. de Gyn. et de Chir. Abdom., 1901, No. 2.

of the disease. Salpingitis has a direct bearing upon it. Elizabeth Hurdon¹ adds one more case of this disease to medical literature but a few months after Le Caunt's² report on the "Genesis of Carcinoma of the Fallopian Tube in Hyperplastic Salpingitis." Hurdon's case was under Howard Kelly, and the patient consulted him for the usual cause—sanious vaginal discharge. She was 63 years old, an unusually advanced age for cancer of the tube, though in Pawlik and Nowy's case the patient was 70. Hurdon's patient had borne 4 children to term, and had been in good health until about 9 months previously, when she suffered from typhoid fever, after which she became subject to an almost constant sanious vaginal discharge, with frequent fever. There was an irregular soft mass on the left side of the uterus. Pyosalpinx was diagnosed, and Kelly removed by abdominal section the uterus, right tube, and the left appendages, which included the tumor. The right ovary, small and perfectly normal, was not removed. The tumor adhered to the sigmoid flexure, which was torn through to the mucous membrane during separation and repaired. Recovery was speedy. The disease lay in the right tube, which was about 5½ inches long; the middle and outer portions were greatly dilated. The tube contained a granular friable mass, consisting of finely branched papillary outgrowths, which had coalesced to a great extent, forming a more or less homogeneous mass. The growths sprang from the mucous membrane lining the inferior part and the outer third of the tube. The ovary was slightly enlarged and contained a few cysts and the broad ligament was infiltrated. The papillary growth was truly cancerous and had invaded the muscular coat in parts, and it was traced with ease to the branched folds of the mucosa. The ovary was invaded at a point where it touched the tube; the uterus and right tube were healthy. The after-history is instructive. Two years and one month after the first operation abdominal section was once more performed, as the patient suffered from a feeling of discomfort in the hypogastrium. Two small masses, proved to be cancerous on microscopic examination, were dissected out of the stump of the left broad ligament and the back of the bladder; a few smaller deposits on the adjacent peritoneum could not be removed. One year after the operation the patient appeared to be in good health. Knauer³ reports a case of adenocarcinoma involving both tubes and ovaries. He regarded the disease as developing primarily in the tubes, for the following reasons: The ovarian tumors presented the same structures as the tubal. Only portions of the ovarian stroma were affected, the cancer-cells having invaded the normal tissue in different places, while in no instance was the germ or follicular epithelium involved. The writer calls attention to the fact that while only 4 cases of cancer of both tubes have been reported, the simultaneous occurrence of the disease in both tubes and ovaries has not previously been noted.

Landou's Sign of Slight Ascites.—According to Landou,⁴ slight

¹ Bull. Johns Hopkins Hosp., Oct., 1901.

² Epitome, Nov. 23, 1901.

³ Centralbl. f. Gynäk., 1901, No. 43.

⁴ Med. Press and Circ., Oct., 16, 1901.

ascites is frequently a very early symptom occurring in connection with malignant growth. By the usual diagnostic methods it is, however, extremely difficult to appreciate and recognize small quantities of free fluid in the peritoneal cavity. A characteristic sign, known as Landou's sign, affords in some cases a valuable help in the recognition of the presence of a small quantity of fluid in the abdomen. Landou claims to have been greatly assisted in arriving at a diagnosis by observing whether it was possible or not to grasp the uterus bimanually—that is to say, to make the fingers meet at the sides of the pelvis. With the patient lying flat on the back, the uterus is slightly depressed, and is described as giving the impression of resting on a cushion of air or a small collection of fluid. Continuing the examination, the patient is placed in the raised pelvic position and the thighs are flexed, when the uterus can be examined bimanually without difficulty, and the fingers are found to meet at the sides of the pelvis, thus indicating that the fluid has gravitated in the direction of the diaphragm. It will be easily seen that for the success of this manoeuvre the bladder must be empty. There is no malady in which it is more desirable to improve the chances of correctly diagnosing the condition as early as possible than in malignant disease, and Landou's suggestion is sure to excite considerable interest on this account.

Appendicitis in Connection with Pelvic Disease.—Fränkel¹ believes that it is time to abandon the popular view that appendicitis is peculiar to the male sex. Infection may extend to the appendix from the diseased pelvic organs, or vice versa, in two ways, viz.: By an intraperitoneal route along the blood-vessels and lymph-vessels of the suspensory ligament of the ovary (*ligamentum appendicula ovaricum*), or by direct contact of an abnormally long appendix with the uterus or right tube or ovary, or fixation of the adnexa at the pelvic brim; by an extraperitoneal route between the folds of the mesocecum, or in consequence of the extraperitoneal development of the cecum and appendix. The most frequent pelvic complication of appendicitis is suppurative inflammation of the tubes and ovaries, especially on the right side. Rarely an abnormally long appendix may be found on the left side of the pelvis. The fact that torsion of the pedicle in cysts of the ovary and parovarium is often noted in connection with appendicular trouble may be explained by the increased intra-abdominal pressure and peristalsis accompanying perityphilitis. Since acute inflammation confined to the right tube and ovary is comparatively rare, when this condition is associated with appendicitis a direct causal relation must be inferred, especially in young subjects with right-sided pyosalpinx or idiopathic parametritis, when gonorrheal or tubercular infection can be positively excluded and there is no history of a previous acute vaginitis. The writer does not accept Edebohl's theory of the causal relation between movable kidney, chronic appendicitis, and right adnexal diseases, and believes that the palpation of slight enlargement of the appendix is an uncertain means of diagnosis, and the sta-

¹ *Centralbl. f. Gynäk.*, 1901, No. 40.

tistics with reference to the relative frequency of associated adnexal and appendicial disease based upon this sign are open to grave error. Repeated attacks of localized pain, with occasional elevations of temperature just before or during menstruation, accompanied by gastrointestinal disturbance, should direct attention to the appendix, and, after other means of relief have failed, furnish an indication for appendectomy. In every case of appendicitis in the female a thorough examination of the pelvis should be made, preferably under anesthesia, in order to avoid errors. The appendix should be examined in every case of abdominal section for pelvic disease, and should be removed not only when it is manifestly diseased, but even when it is adherent, since if it is spared the adhesions generally re-form, and morbid changes are apt to occur in the muscular wall of the appendix in consequence. On the other hand, during the course of an appendectomy the conditions of the uterus should be noted. When an appendicial complication of adnexal disease is suspected, the abdominal is preferable to the vaginal route. The right tube and ovary can be reached through the classic incision in the flank, but if both ovaries and tubes are affected the median incision is better. Deep-seated abscesses may be drained per vaginam, or through the rectum in children and virgins; if situated too high up to be reached from below, the pus may be evacuated through an abdominal incision, the diseased appendix and adnexa being removed subsequently.

Salpingotomy.—Govilliovd¹ recognizes only two indications for this operation, viz.: (1) Cases in which the tube is thickened and its abdominal end is adherent and closed, the patient suffering so much pain that she is incapacitated from going about and attending to her work. (2) Chronic catarrhal salpingitis and hydrosalpinx. He does not approve of the conservative treatment of pyosalpinx except in those cases in which the pus is known to be absolutely sterile. Salpingotomy is unattended with risk, and recurrence is rare, while the possibility of future conception is a decided advantage.

Alcohol in the Treatment of Inflammation of the Pelvic Organs.—Schmid² reports 70 cases of endometritis and diseased adnexa, which were treated as follows: The abdomen was covered with a compress saturated with 60 % (later 95 %) alcohol, over which was placed rubber tissue, these being removed thrice daily. Tampons saturated with 30 % alcohol were inserted in the vagina every other day. The rest of the treatment consisted in lysol douches, rest in bed, massage, and simple diet. At first there were some pain and elevation of temperature. Twenty patients were cured; 11 were improved, 31 had a symptomatic cure, while the local condition was improved. Twenty-six patients were treated with ichthyol tampons for the sake of comparison. Of these, only 1 was cured; in 5 the symptoms were entirely removed; in 9 there was improvement both in the symptoms and in the local condition; in 9 in the symptoms only.

¹ Lyon Méd.; Centralbl. f. Gynäk., 1901, No. 13.

² Inaug. Diss.; abstract in Centralbl. f. Gynäk., 1901, No. 39.

Hot Air in the Treatment of Pelvic Exudates.—Kehrer,¹ in view of the fact that at least 95 % of all pelvic exudates tend to become absorbed, emphasizes the importance of assisting natural processes by the use of such agents as reduce local hyperemia. He uses hot vaginal douches several times daily, allowing at least 3 gallons of water to flow through a double-current glass tube, as well as hot sitz baths and compresses applied to the lower abdomen. He speaks highly of the apparatus devised by Polano, in which continuous heating is effected by electricity. Thomson² commends the method of treatment introduced by Polano, with which he has obtained striking results in cases of chronic perimetritis. Not only is pain promptly relieved, but exudates are rapidly absorbed. The only contraindications are advanced cardiac lesions or disease of the arteries. Polano,³ of Greifswald, has been led, by observing the favorable effect of hot-air treatment on chronic diseases of the joints, to apply the same to the pelvis with the view of favoring the absorption of exudates. Cases of chronic pelvic disease are alone suitable for the treatment, and resorption is favored by the free supply of blood-vessels and lymphatic vessels which the affected parts enjoy. Several cases in which exudates were absorbed after from 14 to 20 sittings are reported by the writer. He believes the hot-air treatment a great aid in the absorption of the inflammatory material remaining after evacuation of an abscess by an incision in the abdominal wall. The treatment is to be carried out while the wound is open and granulating. The writer found it a distinct help in alleviating the symptoms and softening the exudate in a case of actinomycosis of the abdominal wall after incision and curetting. In addition to improvement in the physical conditions, the subjective symptoms, notably pain, were almost always markedly relieved. Patients who had to be lifted into the hot-air apparatus were able to get up without assistance at the end of treatment, and to perform complicated movements, such as bending of the back, and the lifting of objects without pain. No bad after-effects were noted in any of the patients, most of whom were weakened by long-continued disease. The apparatus employed is similar to that ordinarily employed for joints, but is provided with padded and elevated supports for the back, pelvis, and hips. The top of the apparatus turns back on a hinge, the patient lies down on the supports, with the shoulders projecting from one end of the box and the thighs from the other, and the top is closed into place. Ordinary devices are employed to prevent burning. The heat is supplied by a Bunsen burner, which is placed in a chamber connecting with the main hot-air chamber. The apparatus is made of wood covered with sacking, and painted without and within, with soluble glass to lessen the danger of combustion. A thermometer registering as high as 150° C. is provided. The patients will bear at first a heat of 120° C. for 20 minutes, and after a week or so will endure for 45 minutes a heat of 135° to 150° C. The effect on the skin is re-

¹ *Centralbl. f. Gynäk.*, 1901, No. 52.² *Ibid.*³ *Centralbl. f. Gynäk.*, 1901, No. 39.

markable; the patients drip with sweat, even the face and upper extremities. The skin of the parts included in the apparatus is deeply injected, sometimes bright red. The introduction of the speculum shows a marked increase of the cervical secretion. The only sensation of which the patients complain is a slight prickling. Cooling is allowed to take place gradually, and the patients are then dried off and lie in bed for an hour. The treatment takes considerable time—about an hour to each patient; but after the surgeon has started the apparatus, the care of it may be safely left to a nurse. [Further experience will be necessary to establish the value and limitations of this method.]

ABDOMINAL SECTION.

Küstner's Incision.—[There are numerous methods of entering the abdominal cavity which have for their aim an avoidance of visible scar and of hernia.] R. Von Fellenberg¹ calls attention to the method of Küstner. The details in outline are as follows: Just above the mons veneris, where the pubic hair is normally present, a long horizontal incision, convex downward, is made through the skin and superficial fascia down to the deep fascia. The upper and lower margins of the wound are then liberated from the sheaths of the recti, except in the middle line, where the attachment is apt to be more dense, and which may be left or divided with the knife. Then through the side which is over the most obvious part of the disease the abdomen is opened vertically in the usual manner. Fellenberg's records include a large variety of cases, and show this incision to be as good as any other in all respects, and better than most in that after it is healed and the hair has grown again over the region, the scar is hidden either by the hair or by the fold in the abdominal fat or by both.

The Transverse Incision of Pfannenstiel.—Similar to the incision of Küstner is that of Pfannenstiel, described with its results by B. Daniel.² It is made in the same manner and in the same region as is that of Küstner, but the sheath of the rectus muscle is divided transversely, while the muscle-fibers of the peritoneum are also cut vertically. It will, therefore, be seen that in this method the incision through that all-important structure, the anterior sheath of the rectus, lies at right angles to that through the rest of the opening into the abdominal cavity. Therefore, only at their point of intersection could hernia take place. The results of the operation are exceedingly flattering and its cosmetic advantages obvious, while its adaptability is wide. It is not, however, suitable in pus cases, because it is very difficult to establish drainage.

The Operative Treatment of Collections of Pus in the Uterine Appendages.—Mandl and Bürger³ contribute an interesting paper upon this subject, which is of especial interest to obstetricians in view of the treatment of pelvic abscess following puerperal septic infection.

¹ Centralbl. f. Gynäk., 1902, No. 15. ² Centralbl. f. Gynäk., 1902, No. 15.

³ Arch. f. Gynäk., 1901, Bd. Lxiv, Heft 1.

The material for this paper included 273 cases in Schauta's practice. The operations adopted in these cases consisted of the removal by laparotomy of pus-containing tubes, the removal of the tubes and uterus by laparotomy, incision and drainage of purulent collections through the abdominal wall, the removal of the uterus and both tubes through the vagina, the removal of a diseased tube through the vagina, with the preservation of the uterus and the other tubes, and the opening and emptying of a tubal abscess through the vagina. The writers report their experience with these various methods with those of other operators. The question of drainage is fully discussed, and also the permanent effects secured by various methods of operation. The writers draw attention to the fact that disease of the fallopian tubes is rarely unilateral, and that operation which removes one tube only must often be supplemented by a second operation, removing the second tube. The writers state a very important general principle, which is now recognized by surgeons—namely, that in the presence of fever operation should be deferred if possible. If the patient is growing worse, vaginal incision and drainage should be performed. When the patient is convalescent and the pus has become practically sterile, radical operations should be undertaken. The writers conclude that if possible operations for the relief of abscesses in the uterine appendages should be done through the vagina to avoid infecting the peritoneum. When both fallopian tubes are involved in suppuration, they do not advise removal of both tubes by abdominal section. They believe that the operation is often followed by the unfavorable complications attending abdominal section, and that a permanent satisfactory result is rarely obtained. In cases in which the disease is limited to one fallopian tube, and the surrounding tissues are healthy, such tube may be removed to advantage by abdominal section. It is often necessary in these cases to make a preliminary puncture to ascertain the condition of the pus before operating. When removal through the vagina offers great technical difficulties, abdominal section may be chosen. The removal of both suppurating tubes and diseased tissues is best performed by vaginal section. The permanent results are better and the patient escapes the unfavorable complications of abdominal section. The same ground of reasoning applies to the removal of one fallopian tube through the vagina, as stated with reference to the abdominal operation. Only when the pus contained is known to be sterile is the operation advisable. Vaginal incision cannot be considered as an operation of cardinal value, but as a means for diagnosis and of meeting threatened complications. In exceptional cases abdominal incision and drainage of collections of pus may become necessary.

Infection of the Abdominal Wound during Operation.—Peiser¹ states that even in cases of benign adenocystoma of the ovary cells from the fluid may be transplanted to the abdominal wound or to the site of a trocar puncture, from which growths develop similar in character to the parent tumor. These may grow internally into the intestine

¹ *Monats. f. Geburt. u. Gyn.*, Bd. xvi, Heft 2, 1902.

and externally through the skin, and these secondary growths may become cancerous. The writer infers from this fact not only that explorative puncture or tapping of ovarian cysts is a dangerous procedure, but that during operation the edges of the wound should be carefully protected before the contents of the cyst are evacuated, especially if they be thick and gelatinous. Schaeffer¹ reports a case of ovariectomy in which the tumor was found to be an adenocarcinoma. A recurrence occurred which was confined entirely to the cicatrix, the pelvic and abdominal cavities being healthy. He infers that the wound was inoculated at the time of operation.

The Lessening of the Abdominal Cavity and Prevention of Ventral Hernia through Doubling the Abdominal Wall.—Heidenhain² quotes Hegar's observation that upon extirpation of a voluminous tumor there often exists a great surplus of abdominal wall. The fascial layer is thin and the abdominal muscles weakened, disposing to ventral hernia, while in the abnormally increased cavity a prolapsing liver or stomach, wandering spleen, or chronic intestinal inertia are no exceptional conditions. As a preventive measure Heidenhain has lessened the cavity and strengthened the muscle by doubling the abdominal wall, exclusive of the skin and cellular tissue, in a manner similar to a man's double-breasted coat. After the removal of the tumor the skin with the fatty layer is separated from the muscular part of the abdominal wall, the separation being close to the upper surface of the fascia and causing little or no bleeding. The right side of the abdominal wall is raised, the left side is passed under and its edge sutured to the parietal peritoneum about a hand's breadth beyond the median line with a continuous suture passing through about one-half of the thickness of the wall. This closes the abdominal cavity. The right side is then laid over the left and its edges also securely sutured. The skin of both sides with the fatty tissue is then united along the median line without the removal of any of the superfluous skin, thus leaving space for a new fatty layer when the woman recovers health. This procedure requires a long incision, but it guards against the danger of ventral hernia. A too great lessening of the abdominal cavity may be inconvenient, as the possibility of a subsequent pregnancy must be taken into consideration. [This method impresses us as one worthy of trial in a selected class of cases.]

Fellenberg and Daniel³ recommend the use of suprapubic transversal incision as less liable to postoperative hernia than the longitudinal. Daniel especially advocates Pfannenstiel's modification of the transverse incision, in which, after cutting through the skin, fatty layer, and fascia, the muscle and peritoneum are incised longitudinally, and the wound is sutured in 3 or 4 layers. He considers this method as an absolute protection from hernia in all classes of cases to which it is adapted, as inflammatory diseases of the adnexa and malpositions of the uterus; but the transversal incision is not practicable in cases of large

¹ Zeitschr. f. Geburtsh. u. Gyn., Bd. xiv, Heft 3, 1902.

² Centralbl. f. Gynäk., Jan. 4, 1902.

³ Centralbl. f. Gynäk., No. 15, 1902.

adnexal tumors, in uterine myomas, or ectopic gestation. Many American celiotomists have secured satisfactory results by using a continuous suture of fine chromicized catgut for the peritoneum and fascia, and by the use of interrupted silkwormgut sutures which include all of the abdominal wall except the peritoneum. The absorbable suture approximates accurately the peritoneum and the fascial layer, while the stronger silkwormgut suture bears the strain during the healing process. It is undoubtedly true that finer strand catgut can be so thoroughly sterilized that it does not produce either irritation or infection.

Drainage after Abdominal Section.—Burckhardt¹ reports from the clinic at Würzburg 31 cases in which, for some indication, drainage was employed after section. These cases were 6 of ovarian tumors, 18 of pyosalpinx, 2 of tubal pregnancy, 2 of suppurating uterine tumor, and 3 of peritonitis. Of these patients, 8 died after operation; 7 of them of peritonitis, and 1 of pneumonia and pleurisy. He concludes that drainage should be employed in the following cases: (1) When pus in large quantities has soiled the field of operation and the abdominal cavity. (2) When a large raw surface has been left by operation the walls of which are necrotic and infiltrated, and when sound tissue cannot be brought together by suture. (3) When a portion of a tumor must be left behind because of its firm adhesions, and especially when such adhesions are to the intestine. (4) When the bladder or intestine is injured, no matter how carefully they may be sutured. (5) When pus-tubes are so adherent that they cannot be separated from the surrounding tissue after they have been opened and emptied. In this class of cases also he would use iodoform gauze as a drain; in other cases he would drain with a glass tube. He places very little reliance upon the microscopic examination or test by culture or puncture in cases of suppurative disease. He believes the results of such tests are too uncertain to be a safe guide in employing drainage.

The Angiotribe.—James N. Ellis² prefers Doyen's instrument. The portion of tissue which is included between the jaws of the angiotribe is compressed to the thinness of paper. The watery elements of the adipose, muscular, and elastic tissues in the track of the instrument are pressed to the sides of the shank of the angiotribe, leaving only the fibroserous and cellular coats of the vessels, and a thin, ribbon-like sheet of compact connective tissue, in the channel of the instrument. The nerves, cords, and the middle and inner coats of the arteries and veins are completely severed, the latter retracting, incurvating, and occluding the lumen of the vessels as when subjected to torsion. The lymphatics, in common with the outer coats of the veins and arteries, are firmly agglutinated and rendered impermeable. According to Thumin, a microscopic examination of this compressed tissue shows that its integrity is not completely destroyed, but that it is simply compactly compressed, and observations prove that necrosis and sloughing do not result, but that a gradual process of revitalization takes place.

¹ Zeitschr. f. Geburts. u. Gyn., 1901, Bd. XLVI, Heft 2.

² Ann. Gyn. and Obstet. Jour., Dec., 1901.

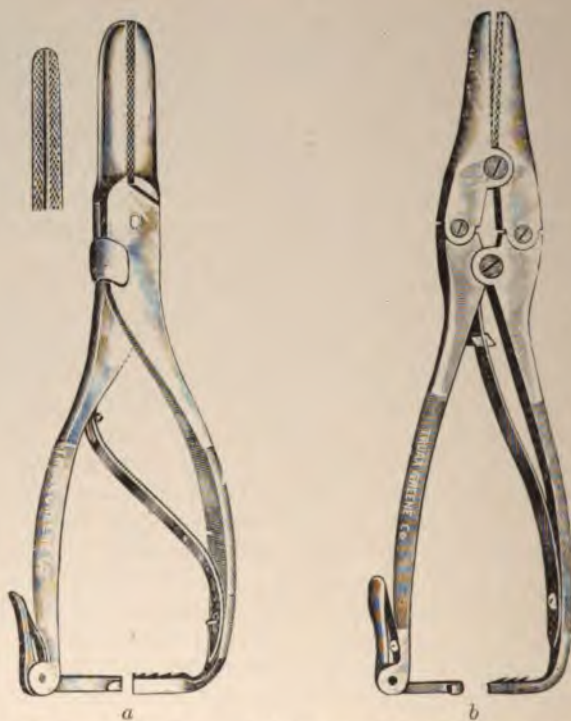


Fig. 74.—The Newman pressure clamp. Model *a*, designed for both abdominal and vaginal work. Model *b*, the more powerful instrument for use in cases in which 1000 pounds or more pressure is required (Newman, in Jour. Am. Med. Assoc., June 7, 1902).



Fig. 75.—Representing the usual methods of hemostasis of the broad ligament: *a*, *En masse* ligation, right side; *b*, individual ligation, left side, with running catgut suture of gaping stump (Newman, in Jour. Am. Med. Assoc., June 7, 1902).

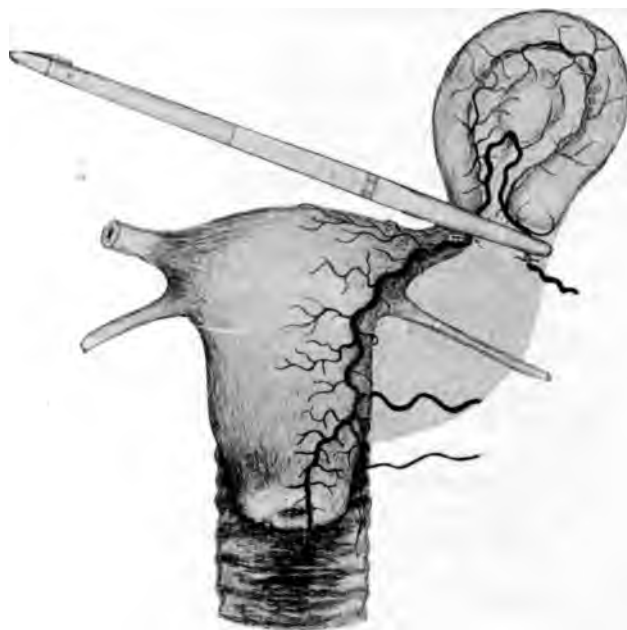


Fig. 76.—The application of the pressure clamp in abdominal excision of the appendages. The same principles are applied in the vaginal operation (Newman, in Jour. Am. Med. Assoc., June 7, 1902).

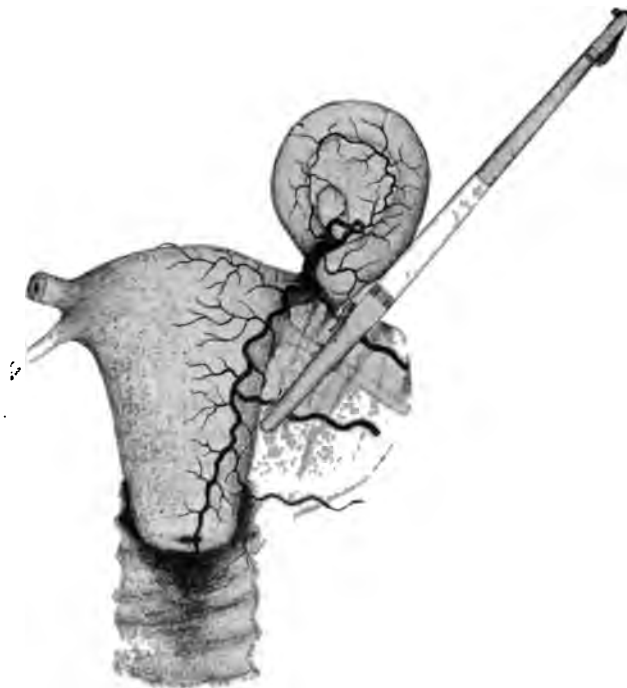


Fig. 77.—Mode of applying the pressure clamp for abdominal hysterectomy. The same principles to be applied in vaginal hysterectomy (Newman, in Jour. Am. Med. Assoc., June 7, 1902).

The author frequently reinforces the hemostatic action of the angiotribe by placing a very fine catgut ligature in the channel or groove made by the jaws of the instrument. H. P. Newman¹ has devised pressure clamps for hemostasis of the broad ligaments, and compares the results with those following the usual methods of hemostasis. The accompanying cuts (Figs. 74 to 78) illustrate the process.



Fig. 78.—The linear stump after the use of the Newman clamp and ligation of the ovarian artery (Newman, in Jour. Am. Med. Assoc., June 7, 1902).

Vaginal Incision in Pelvic Abscess.—Bürger² reports 273 cases of pelvic abscess, including only those of suppuration of the tube and ovary. He emphasizes the fact that in pyosalpinx the conditions are essentially different from those which are present in ordinary abscesses, since even after evacuating the pus the diseased mucosa remains as a source of fresh infection and renewed suppuration. Hence the indications for incising pus-tubes per vaginam are comparatively limited.

¹ Jour. Am. Med. Assoc., June 7, 1902.

² Centralbl. f. Gynäk., 1901, No. 43.

Of these, fever is the most important, as it shows the presence of an acute process, with fresh pus, the escape of which into the peritoneal cavity during laparotomy is often fatal to the patient. Excessive tension of the sac and threatening perforation into adjacent organs are other indications for incision, which, however, is to be regarded simply as a palliative measure, to be followed later by abdominal section if necessary. When it is impossible to remove the pus by incision alone the diseased tube may be extirpated by the vagina. In analyzing his cases the writer finds that in a considerable proportion it was necessary to repeat the operation in consequence of fresh suppuration in the opposite tube or imperfect drainage of the abscess-cavity. The results were seldom permanent, as the local pains usually persisted or were aggravated. A radical operation was necessary in 25 % of the cases. In short, vaginal incision is to be regarded merely as a safe and easy way of temporarily relieving the patient from the symptoms incident to retained pus and of postponing the radical operation until it can be performed with less danger of infecting the healthy peritoneum.

Abdominal and Vaginal Celiotomy.—[No unchangeable laws governing the choice between these two methods of operating can possibly be laid down, but the general principles are expressed as follows by MacNaughton Jones:¹] In the abdominal method there is a better field of view, greater command over the affected organs, fuller power of exact dealing with the ovaries and tubes in carrying out conservative measures and in breaking up extensive adhesions. Knowledge of the size of cysts, or sacs, or solid growths greatly facilitates their treatment. There are, however, cases in which the vaginal route is the operation of selection. In simple parovarian cysts and small cystic tumors of the ovaries, in cases of cystic diseases of the adnexa, complicating small intestinal myomas, and subperitoneal myomas in the culdesac of Douglas, in adnexal trouble, complicating retrodeviation of the uterus—in short, in cases which are more or less recent, with movability and nonadhesion of the mass, with the uterus itself immobile—by Martin's operation of anterior colpotomy the uterus can be readily turned into the vagina and the adnexa removed if necessary. Should difficulty arise, the advantage of removing the mass in pieces by claw, forceps and scissors, by Doyen's drill, by slicing the uterus into fragments (Landau's method), can be resorted to. As a rule, however, the frequency of cancer and tuberculosis in this region makes it advisable not to follow this method oftener than is necessary. When in doubt, the abdominal route is much the better. Conservatism in operating on the adnexa is always very important, and is really the source of modern success. Thomson² is strongly in favor of vaginal section instead of celiotomy in all cases of abscess of the tube or ovary which can be reached through the posterior fornix. He believes that the most important point is the making of a large incision, followed by thorough evacuation of all the abscesses and free drainage. The results of this treatment are almost invariably satisfactory as regards the relief of pain, diminution

¹ Med. Press and Circ., Jan. 22, 1902.

² Centralbl. f. Gynäk., 1901, No. 20.

of the inflammatory masses, and restoration to comparative health. Dührssen¹ reports 780 cases of anterior vaginal section for different conditions. He believes that most of the cases formerly treated by laparotomy can be handled equally well by the vaginal route, with a mortality less than 3 %. There is no external cicatrix, no danger of intestinal adhesions (?) or hernia, and the convalescence is short, most of the patients being discharged at the end of from 9 to 12 days. The only subsequent complication is the possible interference with parturition, which may be avoided by suturing the peritoneum separately. Among the cases reported were 70 ovariectomies for large cystomas with no deaths, and 28 operations for extrauterine pregnancy, with 1 death from an accidental cause. Among the conservative operations performed by the vaginal route the writer mentions closure of the tube to prevent conception, salpingostomy, and ignipuncture for cystic degeneration of the ovary. The latter procedure he has found an efficient way of relieving the pain and hemorrhage due to this condition. There were 70 cases of myomectomy, in some of which the tumor exceeded in size the fetal head at term.

The Incision in Vaginal Section.—Webster² describes his method of anterior colpotomy in a paper which is profusely illustrated. He makes a circular incision around the cervix just below the attachment of the vaginal wall. This is joined by a mesial incision 1½ inches or more in length, dividing the anterior vaginal wall. The cervix being well pulled down, the wall of the vaginal vault is stripped upward until the anterior peritoneal pouch is reached. The anterior vaginal wall is partially stripped from the base of the bladder. The uterovesical pouch is then opened. The advantages of this method over all others are, the uterus can be pulled down to a greater extent and more room is obtained for intrapelvic manipulations. At the end of the operative procedures, the uterus is pushed into place, the peritoneum sutured, and the vaginal incisions closed with chromic catgut.

COMPLICATIONS DURING AND AFTER ABDOMINAL OR VAGINAL SECTION.

Emphysema of the Skin.—Madlener³ reports 4 cases, making 25 which have been recorded. He believes that the complication is not so rare as is generally believed. It occurs after closure of the abdominal wound by the escape of air from the cavity between the layers of the wall, and has no connection with imperfect closure of the wound. Trendelenburg's posture favors the sucking of air into the cavity and the occurrence of emphysema; hence the importance of lowering the patient to the horizontal position before closing the wound. Treatment is rarely required, though in exceptional cases multiple incisions may be necessary. [This is certainly an exceedingly rare condition

¹ Proceedings of the Thirtieth Congress of the German Surgical Association.

² Am. Gyn. and Obstet. Jour., Dec., 1901.

³ Centraltbl. f. Gynäk., 1901, No. 19.

in this country. We have seen no case, and can recall but 2 or 3 reports of cases.]

Intestinal Anastomosis.—For intestinal anastomosis, which is usually performed by means of the Murphy button, O. H. Allis¹ prefers suturing through the entire thickness of the abdominal wall. In cases of resection of a portion of the bowel when end-to-end anastomosis is required, the operation is performed as follows: The ends are placed side by side, the serous surfaces together, held in position temporarily by tenaculum forceps used as women use pins, then one-half the circumference is sutured securely through both mucous and serous membranes. It does not matter what stitch is used—the whip-stitch, through-and-through stitch, or over-and-over. All that is essential is that the approximated bowels be securely united. Having firmly sutured one-half the circumference, he removes the forceps, and, turning the partly united structures half around, seizes the seam with the tenaculum forceps, and with a pair holding the work a little further on, the through-and-through suturing can be continued almost around the entire circumference. When near the end the intestines should be made to assume the end-to-end position, the mucous edges are turned in for the remaining part, and the serous surfaces held in place with serrated forceps until sutured. The rule that the serous coat only must be pierced is no longer entertained, and the operator will act wisely if he penetrates the thickness of the intestinal wall. In this way every possible intestinal anastomosis can be accomplished—viz., end-to-end, lateral, and insertion. Allis has used this method successfully in cases in which the Murphy button had proved a failure, and considers it as an improvement upon that procedure.

DISEASES OF THE OVARIES.

Ovarian Dystrophy.—According to Paul Dalché,² ovarian dystrophy may show two distinct sets of symptoms, those of abortive exophthalmic goiter or those of myxedema. In either case ovarian opotherapy is indicated. Menstrual troubles are noted, tachycardia, slight protrusion of the eyeballs, some cutaneous pigmentation or vitiligo, nervous troubles, tremor, etc., with perhaps some thyroid enlargement; or the woman is chlorotic, and shows some edema, localized or general, a state of pseudomyxedema. Several case-histories are given to illustrate the condition. Dalché believes that modifications of the ovarian secretions may be the cause of true exophthalmic goiter.

Origin of Dermoid Cysts from Wolffian Bodies.—Bandler³ supports the theory that ovarian dermoids develop from the wolffian bodies by reference to the fact that the epithelium of the wolffian duct is derived from the ectoderm. He even goes so far as to affirm his belief that cystoadenomas of the ovaries arise from the primordial kidneys, the tubules of which penetrate, not only the hilum, but the stroma of

¹ Am. Jour. of Obstet., Jan., 1902.

² Bull. Méd., Nov. 16, 1901.

³ Arch. f. Gynäk., Bd. LVI, No. 3, 1901.

of the gland. He explains the development of mixed tumors on the theory that they arise from ingrowths from the wolffian bodies, which, on account of the prevalence of the hair and skin, are recognized as dermoids.

Tuboovarian Cysts.—[Among the abnormalities to which the genital tract in women may be subject is one which exists normally in some animals—viz., the tube is directly continuous with the ovary.] G. Preiser¹ presents the following conclusions on this subject: (1) A congenital ovarian tube has not been definitely proved in man. (2) The majority of tuboovarian cysts have the following origin: A sactosalpinx and ovarian cyst adhere together and the separating membrane later undergoes an atrophy by pressure. In cases in which this relation exists at the fimbriated extremity of the tube the deceptive condition arises of an artificial ovarian tube. (3) The origin of a tuboovarian cyst in the manner of a hematocele is conceivable, but the frequency of the conditions on both sides and the absence of the blood-elements in the contents of the cyst make it unlikely. (4) The presence of genuine tuboovarian cysts in the cavities of which fimbrias either float free or are grown to the walls is explained probably by the theory that after the original growth of tube to ovary an exudate about them takes place. This exudate incloses them, and finally becomes the outer wall of the cysts, making the tube in part its contents.

¹ Arch. f. Gynäk., Bd. LXIV, Heft 3, 1901.

ORTHOPEDIC SURGERY.

By VIRGIL P. GIBNEY, M.D., AND J. HILTON WATERMAN, M.D.,
OF NEW YORK.

THE NECK.

Spasmodic Torticollis and its Surgical Treatment.—C. A. Hamann,¹ before the Section on Surgery of the Buffalo Academy of Medicine, presented the symptoms, clinical history, etiology, pathology, and pathogenesis, diagnosis, prognosis, and treatment of this condition. In conclusion he has submitted the following: (1) The etiologic importance of frequently repeated muscular contractions in the production of the disease; (2) the uselessness of nonsurgical measures and urges the performance of radical and extensive operations.

THE SHOULDER.

Arthrodesis of the Shoulder-joint in Infantile Paralysis.—W. Duncan Lawrie,² in a paper on this subject, states that arthrodesis was first performed by Albert, of Vienna, in 1878, on the knee of a child suffering from paralysis, and has since been applied to all the large joints of the body. Bothezet has only been able to find records of 6 cases in which it has been performed in the shoulder-joint. The writer considers that there are two divisions of paralyzed shoulder-joints. In the first this paralysis of the muscles of the articulation is associated with paralysis of the scapular muscles; in the second, the scapular muscles are sound and the other muscles completely paralyzed. The first class is not amenable to surgical treatment. The indications for arthrodesis are as follows: (1) The muscular paralysis which is the cause of the luxation must be a permanent one and incurable by medicinal treatment; (2) a paralysis should be so localized that the muscles of the scapula, elbow, and hand are absolutely normal. Reference is made to certain conditions which should be estimated before deciding that the paralysis is incurable. The technic of the operation follows. The results in the 3 cases of Bothezet appear to be excellent.

Operative Treatment of Deformities of the Elbow-joint Resulting from Traumatism.—S. Lloyd,³ at a meeting of the Orthopedic Section of the New York Academy of Medicine, read a paper on this subject. He summed up the management of fractures of the elbow: first, exam-

¹ Buffalo Med. Jour., Dec., 1901.

² Birmingham Med. Rev., April, 1902.

³ Med. News, Sept. 28, 1901.

ination and reduction under ether; second, if ankylosis or marked limitation of motion results and does not prove to be due to fibrous bands, operation should be undertaken and everything opposing the movements of the joints should be cut away. The incisions he varied according to the injury. The writer presented two patients upon whom he had operated to further illustrate his paper.

THE HAND.

Operative Treatment of Webbed Fingers.—R. H. Sayre,¹ at a meeting of the New York Academy of Medicine, read a paper on this subject and illustrated on a model his method of operation. It consists in making a flap for one finger, and grafting to cover the other; then taking an A-shaped flap from the dorsum of the hand, slipping it over and stitching it to the palm to form the bottom of the web.

Radiographic Study on Dyschondroplasia.—Molin² has described 3 cases of this affection. The etiology is entirely unknown. The disease attacks the long bones, the metacarpal and phalangeal skeleton of the hand, and it is characterized by the fact that the cartilaginous tissue is regularly developed in bone and ossifies very slowly.

THE SPINE.

Prognosis in Tuberculous Spondylitis.—B. B. Mosher,³ before the Brooklyn Surgical Society, reported 53 cases of this condition. The patients ranged in age from 15 months to 16 years. The time of treatment varied from 1 year to 7. Twelve cases suffered from abscess, 4 cases had no deformity, 25 slight deformity, 10 moderate deformity. Seven of the patients died. A discussion on this subject followed.

Analysis of 26 Cases of Typhoid Spine.—F. T. Lord,⁴ before the clinical section of the Suffolk District Medical Society, reports his observations in this condition. Of the cases, 22 were in males. The time of onset as indicated by pain, which was constantly the initial symptom, varied within rather wide limits; from the latter part of the typhoid till 3 months after defervescence. The pain was usually severe, situated in the lumbar or dorsolumbar region, frequently radiating to the hips, less often to the ilio-costal space, abdomen, and thighs. In one case there was involuntary discharge of urine and feces. The table accompanying the article shows that radiating pain was the most frequent of the nerve-root symptoms, occurring in 10 of the 26 cases. It was not infrequently associated with a disturbance of the knee-jerks. In 7 cases the patella reflex was increased, in 2 it was lost. The site of disturbed sensation was in the lower extremity, and in one case also in the lower trunk. Symptoms of hysteria or neurasthenia were noted in 6 cases. The most satisfactory treatment has been rest in the horizontal position and the application of a plaster jacket. The prognosis is good. The pathology of the process

¹ Med. News, Mar 29, 1902.

³ Brooklyn Med. Jour., Jan., 1902.

² Zeitschr. f. orthop. Chir., 1901.

⁴ Boston M. and S. Jour., June 26, 1902.

seems most reasonably a perispondylitis or spondylitis or both. But Osler considers that in most cases the condition is a neurosis.

E. G. Cutler,¹ before the same society, described in detail the **symptoms of spondylitis typhosa** and reported a case because of its rarity. It was interesting to note that a radiograph showed on careful study no difference from that taken in a healthy subject.

A Plea for the Adoption of a More Accurate and Scientific Method in the Investigation and Treatment of Lateral Curvature of the Spine.—Archibald Young² has devised a skoliosometer differing from that of von Mikulicz. The main difference between the author's method and the aforesaid is that where he was satisfied with figures expressing the deviation from the normal, Young prefers to adopt the simple plan of a readily made drawing to scale of the actual curve lines. One of the most important of the uses to which such an instrument might be put would be in obtaining a reliable register of chest measurement for recruit examination and insurance work. The instrument has been of use also in craniometric work.

Hyperextension as an Essential in the Correction of the Deformity of Pott's Disease with the Presentation of Original Methods.—R. T. Taylor,³ before the annual meeting of the American Orthopedic Association, presented an excellent article on this subject. After describing in detail the method advocated, the writer in conclusion states: (1) Jackets thus applied fix the spine in the most advantageous position for lessening the tendency for the production of deformity; (2) the rapidity and ease with which jackets may be applied; (3) these methods are applicable to mid and lower dorsal caries; (4) it seems comfortable to the patient, as the thorax is well supported and the supracumbent weight is removed from the diseased vertebral bodies to the healthy articular processes; (5) absolute immobilization of the patient in the desired corrected position is obtained; (6) the efficacy of hyperextension has been demonstrated to satisfaction clinically; (7) aside from the danger of excessive and unequal force being used manually by several persons making traction for forcible correction under an anesthetic, these methods enable one operator to adjust to a nicety his pressure and traction without anesthetic, and further enable him to make a diagnosis as to the pathologic state the process has reached, which the size of the deformity does not always tell in regard to the degree of ankylosis. Reference is made to recent bibliography on Pott's disease.

Congenital Elevation of the Scapula Treated by Operation.—J. E. Goldthwaite,⁴ at the annual meeting of the American Orthopedic Association, described the operation, which consisted in making a long incision obliquely over the scapula and turning back the trapezius muscle. The rhomboidei were represented by ten spans and the levator anguli scapulae was much shortened. These were cut away and the shoulder was pulled down. In the discussion which followed this description, V. P. Gibney reported a similar case. McKenzie said that he had recently

¹ Boston M. and S. Jour., June 26, 1902.

² Brit. Med. Jour., May 31, 1902.

³ Johns Hopkins Hosp. Bull., Feb., 1901.

⁴ Med. Rec., Aug. 3, 1901.

seen a case of shortening of the trapezius and other muscles passing from the occiput to the cervical spine, acquired by years of assiduous practice on a violin. Freiberg stated that he would divide these cases into groups. One group would contain the cases in which there is synarthrosis between the scapula and the spine and another would include cases in which the functions of the joint are normal but the scapula unusually high.

The Report of a Case of Abscess in the Posterior Mediastinum Occurring in Pott's Disease Reached by Costotransversectomy.—

J. E. Goldthwaite,¹ at the annual meeting of the Orthopedic Association, reported the case of a child 5 years of age, with Pott's disease of the upper dorsal region and in poor condition, who suddenly developed a type of difficult breathing which resembled ordinary croup. Thorough examination failed to reveal anything in the throat. Abscess of the mediastinum was found and an operation was done. The child convalesced rapidly.

Orthopedic Operations for Intractable Cerebrospinal Lesions.—

Homer Gibney,² at the meeting of the Orthopedic Section of the Academy of Medicine, reported 2 cases of Friedrich's ataxia. The incoordination of the lower extremities was in a measure overcome by myotomies and fasciotomy for correction of the existing pes cavus and trigger toe. He insisted on first correcting the deformity and then the application of properly adjusted apparatus.

Caries of the Spine: An Analysis of 1000 Cases.—J. Hilton Waterman and Chas. H. Jaeger,³ at the annual meeting of the Orthopedic Association, presented a paper on this subject. Of the cases studied, 600 children were in the first years of life; in 6.6 % the disease was cervical, in 70.9 % dorsal, and in 20.9 % lumbar. In over 10 % of the cases the parents were tuberculous. Abscesses were recorded in over 15 % of the cases in the first 10 years of life. Careful inquiry seemed to indicate that traumatism was the existing cause in 298 and infectious diseases in 42 cases.

THE HIP.

Excision of the Hip for Congenital Dislocation.—E. W. Blodgett⁴ reports a case of congenital dislocation in which this operation was performed to diminish the postural deformity, especially the permanent internal rotation. Following the operation flexion and adduction recurred to a degree sufficient to make ultimate recurrence of the original amount not improbable, but no increase in shortening resulted.

Phocomelia.—H. L. Taylor⁵ presented before the New York Academy of Medicine a girl 5½ years old with this condition. When the child began to walk, lameness on the left side was noticed. The diagnosis of congenital shortening of the femur was made, which was confirmed by a skiagraph. Exception was taken to the use of this term phocomelia as representing this condition, but the writer stated that Kummell, Klaus-

¹ Med. Rec., Aug. 3, 1901.

² Med. News, Dec. 28, 1901.

³ Med. Rec., Aug. 3, 1901.

⁴ Boston M. and S. Jour., April 24, 1902.

⁵ Phila. Med. Jour., Mar. 29, 1902.

ner, and other authorities applied the term to such cases as the one presented.

Clinical and Radiographic Analysis of 24 Cases of Fracture of the Hip.—H. A. Wilson,¹ at the annual meeting of the Orthopedic Association, presented a summary of this paper. As far as could be ascertained, all of the cases had been treated by extension for periods ranging from 4 to 6 weeks; while the abductive function was excessive in 1 case, the adduction was excessive in 10 cases. The rotation phenomena were absent in 4 cases and greatly impaired in 2. The flexion phenomena were absent in 1, slightly limited in 16, and normal in 6 cases. Eight of the patients had never attempted to walk.

Congenital Hip Dislocation Treated by the Lorenz Method of Reduction.—W. A. Wood² states that he has treated 7 cases of congenital hip dislocation. He describes in detail the 7 cases and concludes that the bloodless method will give perfect results, especially if the case is very young. In most of the older cases the bloodless method can still be used, and it will retain the head of the bone in a better position, if not actually in the acetabulum. The writer states that Tubby regards the treatment as uniformly successful in children under 7, but he himself is inclined to disagree with this statement. In cases of relapse or unsatisfactory result he is inclined to use Witzel's idea of putting pins into the upper rim of the acetabulum to retain the head in position. In conclusion he adds that his results have not been so good as those reported from the Continent.

Treatment of Congenital Hip Dislocation with Special Reference to the Ambulatory Method.—H. A. Reeves³ describes his method in detail. It consists in first reducing, if possible, the femoral head into the deficient acetabulum by the methods of Bigelow and Paci combined, and while the limb is kept in place the extension instrument is applied. He does not profess to have succeeded in reducing all cases into the rudimentary acetabulum, but has contented himself with converting iliac displacements into the anterior dorsal of supracotyloid, thus considerably diminishing the shortening and lordosis and improving the walk. The author calls attention to a method by which the results of the open operation might be improved.

Autopsy of a Case of Congenital Dislocation Corrected by the Method of Lorenz.—Nove Josserrand⁴ made an autopsy 14 months after the correction, death being due to diphtheria. The report is given in detail. Of special interest is the fact that the muscles on the affected side showed slight atrophy, especially the adductors and pelvic trochanteric muscle. The acetabulum was slightly elliptic and the cartilaginous layer was less developed and wanting on the backward side.

Relative Merits of Osteotomy and Forcible Correction in Deformities at the Knee and Hip.—V. P. Gibney⁵ stated that osteotomy was often preferable to the application of a strong force with divisions of

¹ Med. Rec., Aug. 3, 1901.

² Internat. Med. Jour., May 20, 1902.

³ Lancet, Nov. 23, 1901.

⁴ Boston M. and S. Jour., Jan. 23, 1902.

⁵ Med. Rec., Aug. 3, 1901.

tendons and the like. The writer is of the opinion that when there is even a fair range of motion in the hip it is better to do an osteotomy; the idea being to secure a more lasting result.

Osteomyelitis following Measles.—J. E. Goldthwaite¹ reports the case of a girl of 6 years who 10 days after the onset of measles had severe pain followed by swelling in the left leg, and there were present all the symptoms of osteomyelitis. A few months later a radiograph showed an extensive osteomyelitic process with a whole upper shaft of the tibia as a sequestrum.

Results of Osteotomies for the Correction of Genu Varum and Genu Valgum.—Homer Gibney² reports the results of his experience and observation in this condition. He has tabulated 21 cases, giving the sex, age, general condition on admission to the hospital, nature of the operation, and final results.

Auscultation of the Knee-joint.—W. E. Blodgett³ bases his observations on a preliminary report of 100 cases. He speaks of a snapping, creaking, and squeaking sound being heard with the stethoscope in the normal knee-joint. The first and second sounds are similar. The third is unmistakably different.

Diagnosis and Management of Some of the More Common Lesions of the Adult Knee.—V. P. Gibney,⁴ at a meeting of the Medical Society of the District of Columbia, presented a paper on the subject. A number of cases are reported describing various conditions which affect the knee-joint. Particular attention is called to a severe type of rheumatic knee which is attended with deformity and which yields to forcible correction. The treatment of each of the conditions described is given.

Tuberculous Joint Affection Simulating Acute Rheumatism.—Poucet⁵ has called attention to certain forms of joint tuberculosis which run a course resembling that of acute rheumatism and are not accompanied by any other signs of miliary tuberculosis.

THE FOOT.

The Intercuneiform Bone of the Foot: and New Bone.—Thomas Dwight⁶ reports two instances in which he has met an occasional bone in the human foot which has never been previously observed. He considers that it was once joined to the middle cuneiform by cartilage. It occupies a fossa between the proximal ends of the internal and middle cuneiform bones where they rest against the scaphoid.

Proper Footwear and the Treatment of Weakened and Flat Feet by Mechanical Devices for Maintaining the Adducted Position.—J. A. Sampson,⁷ before the Johns Hopkins Medical Society, read an exhaustive article on this subject. The writer calls attention to the stockings and shoes to be worn. He presents arguments for and against the use of the heel of the shoe. The article contains some excellent illustrations.

¹ Med. Rec., Jan. 4, 1902.

² Boston M. and S. Jour., Jan. 16, 1902.

³ Med. Jour. of Australasia, Mar. 20, 1902.

⁴ Med. Rec., Dec. 21, 1901.

⁵ Phila. Med. Jour., May 10, 1902.

⁶ Amer. Med., April 12, 1902.

⁷ Amer. Med., Jan. 18, 1902.

Tendon Transplantation; Indications for Operation.—R. Whitman,¹ at a meeting of the Orthopedic Section of the New York Academy of Medicine, in a paper which embodied these indications, states that as a rule the operation should be performed only in late adolescence or adult life. The operation will be most serviceable in cases of the hemiplegic type, in which the use of the hand is hampered by persistent palmar flexion. Tendon transplantation applies in principle, of course, to paralysis from any cause. The principles of operative treatment and its inevitable limitations have been indicated in the article.

Epidemic of 38 Cases of Infantile Paralysis.—C. F. Painter,² at the annual meeting of the Orthopedic Association, reported the cases occurring in the city of Gloucester. It could not be traced to any cause and every clue was thoroughly investigated; they were all within a radius of 4 miles.

Fashioning Apparatus for Flat-foot and Deformities of the Toes.—

A. H. Freiberg³ describes in detail a method which he uses in the fashioning of metal braces. Frequent trial has convinced him that celluloid will not answer the requirements which may be expected of it, at least for adult patients. In children, however, it may at times be employed to advantage, but for valgus plates it has seemed better to abandon its use altogether.

Familiarity with the use of celluloid has, however, shown it to be a material possessing advantages in the treatment of hallux valgus, and as well in the treatment of hammer-toe, where these are still amenable to mechanical methods. For hallux valgus celluloid is used to make an adductor, for which purpose a piece $\frac{1}{8}$ inch thick, 1 inch wide, and from 5 to 7 inches long is taken. The degree of adduction is regulated by bending the splint in hot water. The splint is used as a night appliance only, either with or without the use of a toe post for day wear, as the case may require. For hammer-toe material of $\frac{1}{16}$ inch thickness is employed. This is renewed at intervals of a few days until the toe has become quite flexible. In fashioning metal plates for flat-

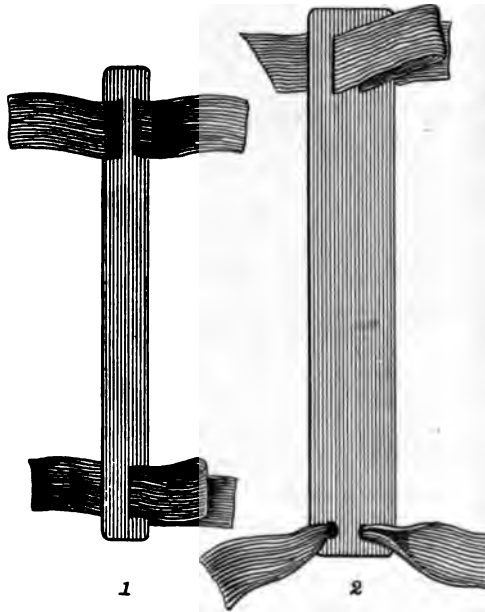


Fig. 79.—1, Plantar splint for hammer-toe; 2, adducting splint for hallux valgus (Freiberg, in Amer. Med., July 12, 1902).

¹ N. Y. Med. Jour., May 3, 1902.

² Amer. Med., June 14, 1902.

³ Amer. Med., July 12, 1902.

foot the method referred to has been found very satisfactory. Briefly described the method as at present employed is first taking an impression of the foot by first painting the sole with the following solution: Tincture ferri chlorid., 50.0; alcohol (80 %), 45.0; glycerin, 5.0. The accompanying illustration (Fig. 79) shows (1) Plantar splint for hammer-toe; (2) adducting splint for hallux valgus. It is practicable by making use of the method described above to produce any type of brace.

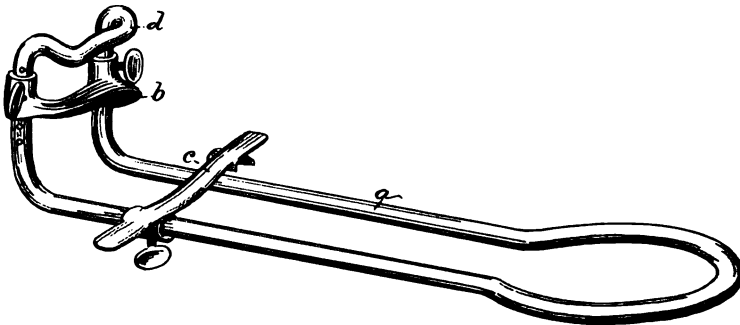


Fig. 80.—*a*, The horizontal limbs expanded into a bow; *b*, the bar on the vertical limbs provided with set screws; the bar (*c*) on the horizontal limbs is shown partly lifted; *d* joins the two limbs so as to prevent the collars from "binding" (Peters, in *Canad. Jour. of M. and S.*, Dec., 1901).



Fig. 81.—Showing method of using the wrench. Notice that the curve on bar (*b*) brings it below the external malleolus, and almost opposite bar (*c*) on the horizontal limbs, thus increasing the leverage (Peters, in *Canad. Jour. of M. and S.*, Dec., 1901).

New Wrench in Use for the Correction of Stubborn Deformities.

—G. A. Peters¹ has devised an apparatus equipped with two movable bars, one upon the upright limbs of the wrench, the other upon the horizontal limbs. The bar, as shown in Fig. 80, is bent toward the bow end of the wrench to the extent of about 1½ inches and is provided with two thumb-screws which fit into small depressions on the upright limbs so that it can be set accurately in any desired position. In operating with the wrench the skin over the part may be further protected by placing

¹ *Canad. Jour. of M. and S.*, Dec., 1901.

blocks of rubber sponge between the bars and the limb. The total length of the wrench is about 2 feet, and the width between its limbs from center to center about 4 inches. The apparatus, being made entirely of metal, can be sterilized either by heat or by immersion in antiseptic solutions. The wrench described has been repeatedly used in children from 8 to 10 years of age, and also on the knee of an average-size adult. The method of using the wrench is shown in Fig. 81.

Operative Treatment of Paralytic Talipes of the Calcaneus Type.—R. Whitman,¹ in an article on this subject, describes in detail the various operations for the cure of this condition. He does not urge operative treatment for all cases of calcaneus, but simply suggests an effective procedure for those cases in which, for one reason or another, mechanical treatment is inefficient.

Technics of the Operation and Results of Tendon Transplantation at the Hospital for the Ruptured and Crippled.—V. P. Gibney,² before the Orthopedic Section of the New York Academy of Medicine, reported the results of 92 operations, describing the details of the operative technics followed at the hospital. The final results were traced in 67; good results were obtained in 34 %, fair in 45 %, negative in 21 %. The following were the deformities for which the operations were performed: Equino-varus, 16—good 4, fair 9, negative 3; equinus, 5 cases—good 1, fair 4; equino-valgus, 22—good 10, fair 9, negative 3; calcaneo-valgus, 10 cases—good 6, fair 3, negative 1; pure valgus, 2 cases—good 1, fair 1; calcaneus, 1 case—fair result; dangle-leg, 5 cases—negative 5; drop-wrist, 6 cases—good 1, fair 3, negative 2.

History, Indications for, and Technic of Tendon Transplantation.—J. Hilton Waterman,³ at a meeting of the Surgical Section of the Buffalo Academy of Medicine, read a paper in which he reviewed the entire literature of this subject. As far as could be learned, the credit of priority belongs to Nicoladoni, for we have been assured on all sides that this operation first came into existence in 1881 at the hands of this brilliant operator, now of the University of Graz, and at that time associated with the clinic of the late Professor Albert, of Vienna. The various methods of operating and the conditions for which they were performed are successively traced from that time to the present. The particular indications for the operation are stated and also the general technic. In conclusion, it was contended that we have an elaborate field of gratifying work, and that the operation has given beneficial results in many cases heretofore regarded as incurable.

Softening of the Tibia.—J. P. Fiske,⁴ at a meeting of the Orthopedic Section of the New York Academy of Medicine, presented a case of localized softening of the tibia at the age of adolescence. At first a positive diagnosis of tubercular disease was made and fixation advised. The plaster splint was worn for 6 months. At the end of that time it was manifest that the tibial curve had increased. Later an osteotomy was performed for the correction of the deformity.

¹ Am. Jour. Med. Sci., Nov., 1901.

³ N. Y. Med. News, July 12, 1902.

² N. Y. Med. Jour., May 10, 1902.

⁴ Med. News, Feb. 8, 1902.

MISCELLANEOUS.

New Method of Breaking Down Adhesions.—G. R. Ord ¹ suggests placing the patient in such disadvantageous positions as to enable the surgeon to manipulate the joint with the greatest ease. The pain is said to be momentary and the period of passive motions greatly shortened.

Bone-filling with Amalgam.—J. H. Barbat ² employed a copper amalgam which he pressed against the sides of a large cavity until the whole surface was covered, leaving a hole which was filled with dental cement, the top being covered with more amalgam. The skin was sutured over the filling and dressings applied.

Costume Deformities.—E. H. Bradford, ³ in an article on this subject, describes the injurious effect of clothing upon the shoulders. The most important injury to the figure from clothing is seen in the trunk, where the effect of corsets is so apparent. The writer states that there is no doubt of the destructive effect of corsets or corset waists upon the normal shape of the trunk, and of the desirability of minimizing this in growing girls. From investigation it appears that exaggerated fulness of the hip, disproportional leanness of the legs and thighs, the flattened chest, the narrow waist, and the long neck are costume deformities to be avoided in a healthy civilization which seeks to preserve what nature gives. This problem of dress has been successfully met in other civilizations. The article contains some excellent illustrations.

Malignancy of Bone Tuberculosis.—Goldthwaite and Painter, ⁴ at the annual meeting of the American Orthopedic Association, pointed out the frequent occurrence of tuberculosis in the soft parts at some time following disease of bone. In the discussion that followed Schaffer stated that the study of the recurrence of tuberculosis needs consideration. Ridlon is convinced that tuberculous foci cannot be removed by surgical means. Lovett was of the opinion that the growth of children suffering from this trouble was greatly impaired. G. G. Davies thought that the recurrence was observed in a small percentage of cases, and thought it was due to constitutional and not to local causes.

Wolff's Law and the Functional Pathogenesis of Deformity.—A. H. Freiberg, ⁵ before the annual meeting of the Orthopedic Association, described in detail this law, which was formulated by Wolff after the most painstaking study of the bones of the body under normal and abnormal conditions. Before the promulgation of Wolff's law the generally accepted theory of the development of acquired deformity was that of Volkmann-Heuter: namely, that consequent upon muscular weakness faulty attitude was assumed, in consequence of which one side of a joint was subjected to greater pressure than normal; the opposite side sustained less pressure than normal. In spite of the fact that Mikulicz and Macewen showed quite long ago that changes in the articular surfaces and epiphyses are not constantly present in genu valgum, but that the principal

¹ Amer. Med., April 12, 1902.

² Amer. Med., April 12, 1902.

³ N. Y. Med. Jour., Oct. 26, 1901.

⁴ Amer. Med., June 14, 1902.

⁵ Am. Jour. Med. Sci., Dec. 19, 1902.

deformity exists in the diaphyses of the femur and tibia, most authors continued, nevertheless, to describe the pathogenesis of this deformity in conformity with the theory of Volkmann-Heuter. If we are unprepared, however, to acknowledge that a truly mathematical demonstration of the structures of the bones has been made, we are, on the other hand, entirely unwilling to reject the law of transformation and its corollaries without further investigation. The author in the article remarks on the specimens examined—(1) ruminants, (2) carnivora, (3) primates. From the researches of Wolff, Zschokke, Schmidt, and others, as well as from the observations presented, the writer believes that it is justifiable to conclude that: (1) the strictly mathematical concept of Wolff's law has not yet been justified by demonstration; (2) save in their mathematical aspects the statements of Wolff's law and its corollaries may be accepted as being in an agreement with observations hitherto made; (3) if we accept the foregoing statements, it does not follow that we must make use of the so-called functional methods in our therapeutic endeavors; they are to be chosen not from theoretic considerations only, but for reasons of expediency and practicability. In the discussion following the reading of this paper R. T. Taylor presented the right femur of an idiotic woman. The specimen was of such interest and believed to be corroborative to such a degree that the case and section of the bone are briefly presented in the article by Freiberg. [We congratulate the author on the excellent manner in which he has presented the results of his investigations on the functional pathogenesis of deformity.]

Injuries to Joints with Special Reference to Their Immediate and Remote Treatment by Massage and Movement.—Howard Marsh¹ believes that massage and exercise are capable of doing a great deal of harm. He cites a case of unrecognized gout in which the patient was made to suffer agony unnecessarily. Also a case where massage and exercises were continued for 9 weeks where a rupture of the tendon of Achilles was overlooked. He urges the great importance of critical diagnosis preceding treatment.

Intermittent Hydrops.—E. G. Brackett² reported 2 cases followed by a careful review of the literature, 68 references being given.

Difficulties in Making a Diagnosis in the Bone Lesions of Nurslings.—R. T. Taylor,³ at the meeting of the American Orthopedic Association, in an article on this subject called attention to the following formidable array of diseases which may present themselves to the clinician for differentiation and exclusion: viz., tuberculous osteomyelitis or epiphysitis, syphilitic periostitis, and osteochondritis, achondroplasia, rachitic proliferation, softening or eburnation, acute anterior poliomyelitis, osteomyelitis, arthritis, typhoid infection, pneumococcus infections, and many other conditions. The author reports a case involving a differential diagnosis between tubercular osteomyelitis, specific osteochondritis, the subperiosteal hemorrhage, and sarcoma. In other conditions mentioned the writer lays great stress on the blood-examinations.

¹ Amer. Med., Jan. 25, 1902.

² Boston M. and S. Jour., Oct. 31, 1901.

³ Am. Jour. Med. Sci., Nov., 1901.

Osteitis Deformans.—A. W. Elting¹ has written a very elaborate and exhaustive article on this subject. Among other things, in conclusion, the author states that it attacks both sexes and does not appear to be related to any constitutional disease; that the etiology is not understood; that the duration is indefinite; and that the disease is but comparatively little influenced by the general health; and, furthermore, that it is not a direct cause of death.

Late Rickets.—Delcourt² concludes that it can be seen in adolescence as well as in infants, but it is less intense and usually less generalized. The rachitic nature of genu valgum and flat-foot has been demonstrated by anatomic evidence.

Congenital Cartilaginous Formation in the Sternocleidomastoid Muscle.—Lengemann³ says that only 16 cases of this deformity have been collected. Several portions of cartilage were found embedded in the muscle.

Calcareous Proliferating Tenontitis and Tenontotheцитis.—Beck⁴ concludes his article with the statement that the tendons in their sheaths have seemed to be but seldom the seats of calcareous deposits, but that more knowledge may be gained by the use of the Röntgen rays, and for this affection the writer has coined the name tenontitis and tenontotheцитis prolifera calcarea.

¹ Johns Hopkins Hosp. Bull., Dec. 19, 1901.

² Jour. Med. Bruxelles; Boston M. and S. Jour., Jan. 16, 1902.

³ Beitr. z. klin. Chir., xxxi.

⁴ Boston M. and S. Jour., Jan. 16, 1902.

OPHTHALMOLOGY.

BY HOWARD FORDE HANSELL, M.D., AND WENDELL REBER, M.D.,
OF PHILADELPHIA.

REFRACTION.

Value of Vision.—H. V. Würdemann¹ calls attention to the fact that the physiologic and the economic limitations of central acuteness of vision are not identical. He alludes to Allport's investigations of the visual requirements of railway employees and his divisions of such workers into 2 classes. A table is given showing the scientific standard of acuteness of vision converted into economic terms. This table will be found useful in calculating the amount of economic damage resulting from the various accidents to the eye.

Methods.—When the focus for a pencil of rays falls behind or in front of the retina, the apparent position of the point from which the rays came varies with the part of the pupil through which they are received. S. Holth's² method for measuring ametropia is based upon this fact. He allows the rays to enter the eye through a narrow aperture, and on shifting the position of this aperture before the pupil, an apparent movement of the object looked at occurs—in myopia with the direction taken by the aperture, in hyperopia against it. The amount of ametropia is measured by lenses placed before the eyes that will aim to make the object stationary. To facilitate slight but accurate movements of the aperture Holth employs what he calls a kinoscope. He draws an interesting parallel between retinoscopy and kinoscopy, pointing out that the latter is a sort of subjective retinoscopy. The object looked at is a white circle. [This is a clever practical adaptation of Schreiner's experiment, but the method requires such perfect, intelligent coöperation on the part of the patient that it will hardly displace any of our present subjective methods.] F. B. Eaton³ observes that in estimating ametropia under a cycloplegic "errors are very often made by careful oculists because they are correcting, not the refractive value in the dioptric path or visual zone, but that of the periphery of the pupil when there is considerable spherical aberration." To avoid this difficulty, he uses disks with perforations of from 2.5 to 4 mm., through which he measures the eye. He claims that the method also serves to detect that form of irregular astigmatism correctable by two cylindric lenses with axes less than 90° apart. He paraphrases the old saw thus: "A weak cycloplegic is a dangerous thing,

¹ Jour. Am. Med. Assoc., Feb. 8, 1902.

² Ann. d'Oculist, April, 1902.

³ Ophthal. Rec., Jan., 1902.

for then the disadvantages of the dilated pupil more than offset the partial suspension of accommodation." [To which we can only add—amen. Our confidence in homatropin wanes more and more each year.] S. M. Burnett¹ is convinced that after resort has been had to the ophthalmoscope, the ophthalmometer, and the retinoscope, we are compelled always to verify our results at the trial-case by patient, painstaking work. To this end time is the most important factor. He argues, also, for postmydriatic trial of the mydriatic finding, on the ground that mydriatics often open up zones of unequal and irregular refraction that are not contributing factors to the total refraction of the true visual zone as found with the average 4 mm. mobile pupil. Hyoscin hydrobromate is said by C. H. Baker² to be the ideal cycloplegic. He bases this statement on its use in more than 2500 cases in 0.5 % solution, having never seen glaucoma or any other undesirable result of its action. Full cycloplegia is established in 1 hour and accommodation returns fully in 48 to 60 hours. S. D. Risley³ shows by illustrative cases that the complexity of a problem in refraction is introduced by the requirements of comfortable binocular vision; viz., an approximate harmonious relation between accommodation and convergence which theoretically can obtain only with two emmetropic eyes and a physiologic range of accommodation and convergence. These are his reasons why glasses should not be prescribed by opticians, nor, in his opinion, should the task be lightly assumed even by the ophthalmologist. According to A. Duane,⁴ the full correction can be applied with success in a large majority of cases of anisometropia, including those in which the difference in refraction exceeds 2 D., provided that the patient is warned that it may take him 1 or 2 weeks to become accustomed to the glasses. It is especially important to apply the correction when there is a beginning squint. Anisometropia is frequently associated with exophoria. The proportion in Duane's 39 cases was high, convergent squint in 11 % and divergent in 14 %. A. S. Percival⁵ finds that for powers higher than plus or minus 10 D., it is impossible to grind lenses of such shape as will allow excentric vision at 25° to the axis to be as good as direct central vision. In simple curvature conditions he uses periscopic lenses and in compound hyperopic and myopic astigmatism he resorts to toric lenses [which are, after all, only periscopic sphero-cylinders].

Myopia.—S. D. Risley⁶ again shows that in a very large percentage of congenitally defective eyes—that is to say, eyes with hyperopic astigmatism—we have a sufficient explanation for the steadily increasing percentage of myopia, notwithstanding the improved conditions of the school-room. This, to his mind, is the genesis of myopia. He invariably orders full correcting glasses for 12 D. or less; but if the myopia is higher than 4 or 5 D. under-correcting glasses for near-work are also given. In myopia of over 15 D. a full correcting glass is seldom desirable. E. Jackson⁷ thinks the better rule is to give a full correction for everything. By thus encouraging the patient to use his eyes more for seeing distant ob-

¹ Ophthal. Rec., Jan., 1902.

² Jour. Am. Med. Assoc., May 3, 1902.

³ Ophthal. Rec., Jan., 1902.

⁴ Arch. of Ophthal., Nov., 1901.

⁵ Brit. Med. Jour., Oct. 26, 1901. ⁶ Jour. Am. Med. Assoc., Nov. 22, 1902. ⁷ Ibid.

jects, we influence him to adopt those occupations that are not so likely to produce increase in the myopia. Galezowski¹ observes that there are frequently fine changes in the fovea of myopes, such as minute points of exudation and atrophy, that are difficult to see on account of the corneal reflex. For their better recognition he employs a 3° prism, and has thus discovered macular changes in patients who otherwise showed the visual signs of asthenopia. [This may be true in Continental Europe, where they seldom resort to mydriatics for the estimation of ametropia, especially in myopes. Many American writers have long since called attention to this point, and recently Hansell has shown that with the Thorner stationary ophthalmoscope inspection of the fovea is quite as easy as that of the disk itself.] The differentiation of refractional or curvature myopia from the axial variety is based by E. Valk² on the corneal radii as estimated by the ophthalmometer's findings. He has found the normal or mean radius of the cornea to be about 7.65 mm. Out of 110 cases of myopia,—9 in private practice,—30 showed a normal radius, 60 showed a curvature radius of less than 7.65 mm., and 20 greater than 7.65. His feeling is that in myopia of any degree if the radius of curvature is less than 7.65 mm. we have a case of refractive myopia, and that in all probability it will not increase. Moreover, that with full correction patients may continue their studies or use their eyes with every prospect of continued good and useful vision. But with a curvature radius of 7.65 mm. or more there is a probability of axial myopia with all its dangerous tendencies. In this class close observation (every 6 months or year) is very necessary and urgent. Sherer³ favors operation in myopia of sufficient degree to embarrass the individual in his social and business relations, in progressive cases, and when serious conditions threaten. C. H. Beard⁴ was fortunate enough to secure vision of $\frac{3}{8}$ in both eyes in a 36-year-old myope after dissection of both lenses and subsequent dissection of semi-opaque capsular membranes. The patient had had trachoma for years, which left her with conical corneas and myopia of 25 D. in the right and 23 D. in the left eye, with best corrected vision of $\frac{7}{8}$ and $\frac{3}{8}$. Beard says the lens matter dissolved as quickly when exposed to the action of the aqueous humor as it does in a child. The postoperative refraction was: right, +2 \odot —5 cyl. ax. 120°; and left, —2 \odot —5 ax. 70°. [One cannot but wish for the widest possible reading—by general practitioners—of the article by] G. S. Hull,⁵ of Pasadena, Cal., who says: "Among the many invalids who seek our southern California climate, there are not a few nervous wrecks who find but little help until, by some stroke of good fortune, they fall into the hands of an oculist; and when he has acted his part, the climate has an easy time in finishing the cure, for which it generally gets the biggest share of the credit. A pair of spectacles often does what our balmy air and eternal sunshine fail to accomplish." In speaking of consumptives, he says: "Think of a victim of tuberculosis coaxing a weak stomach with the most carefully selected foods and at the same time

¹ Rec. d'Ophthal., Mar., 1902.² Ophthal. Rec., Aug., 1902.³ Kansas City Med. Rec., June, 1902.⁴ Ophthal. Rec., Jan., 1902.⁵ Ophthal. Rec., Jan., 1902.

carrying an uncorrected compound hyperopic astigmatism with gastric reflexes." Illustrative cases are submitted, and he questions whether it would not be well to "exhaustively examine the eyes of every consumptive."

MUSCLES.

Heterophoria.—At the 1902 meeting of the American Medical Association the whole subject of muscular anomalies was thoroughly gone over. J. E. Colburn,¹ in his anatomic studies, found the **right eye usually higher** than the left, and the plane of the base of the right orbit less inclined toward the plane of the face than the left. Clinically, right hyperphoria of some degree was present in 75 % of 200 cases examined. He further states that in the hyperopic type the lines of regard are usually directed higher, and in the myopic type lower, than normal. To his mind, atypical development of the bony structures, connective-tissue bands, and the muscles are the predisposing anomalies affecting the lines of sight or visual axes; modifications of innervation are the exciting causes. In the matter of physiology, Ellett and Savage restate the present-day ideas as to ocular motions, and agree that the function of the obliques is to keep the vertical axes parallel with each other. Touching the **management** of heterophoria, E. J. Gardiner² summarizes as follows: (1) Study the patient thoroughly; (2) eliminate all extraneous causes; (3) correct ametropia. Failing in this, strengthen the weaker muscles orthoptically. If in doubt, do not operate. S. C. Ayres³ advises weak prisms (1°) base out, for constant stimulation of the convergence in exophoria, to be supplemented by daily fusion exercise with strong prisms bases out, and for this method claims very good results. Park Lewis,⁴ too, claims that much that is accomplished in the training of the interni is largely psychic. On the hypothesis that nervous energy directed to a muscle or set of muscles increases their blood-supply and consequent efficiency, he orders in exophoria weak prisms to be worn constantly, bases out, and in esophoria, with subnormal abduction, weak prisms to be worn, bases in; in some cases these are incorporated with the ametropic correction. In a few instances he has resorted to this use of "reversed prisms" in strabismic children in whom the refractive correction had not been sufficient to restore binocular vision, and had thus re-established parallelism of the visual axes. E. Jackson⁵ shows how remote are the chances of making absolutely exact adjustment of the muscular apparatus. However, while operations do not cure, they do lessen the deformity, and in a large proportion of cases are steps toward more rational physiologic treatment. His classification of the muscles into primary and secondary rotations, and insistence on paying more attention to the latter in strabismus, is forceful. N. M. Black,⁶ in speaking of the early treatment of squint, explains much of it on Worth's theory of the defective or nondevelopment of the fusion sense. He also quotes Worth to the effect that "the

¹ Jour. Am. Med. Assoc., Oct. 18, 1902.

² Ibid., Oct. 25, 1902.

³ Ibid., Oct. 25, 1902.

⁴ Ophthal. Rec., Feb., 1902.

⁵ Ibid., Nov. 1, 1902.

⁶ Jour. Am. Med. Assoc., May 24, 1902.

fusion sense is fully developed by the sixth year; after that the question of establishing it is almost beyond hope." To Black's mind the chief factors in constant squint are: (1) the deformity; (2) the suppressed vision of the deviating eye; (3) the usual amblyopia of the squinting eye; (4) the refractive status; (5) the fusion sense. He is evidently an enthusiastic convert to the use of Worth's fusion tubes. R. H. Derby¹ feels strongly on this point, saying: "If there is a period in child life when systematic exercise of the amblyopic eye may result in improved acuity of vision, we should in all cases see to it that the weak organ be made strong and the infinite advantage of binocular vision be secured." G. M. Gould² goes much further, and claims that by ocular gymnastics and monocular exercises of the amblyopic eye operative measures can be entirely done away with. He pleads for the fullest test of the physiologic method of treating squint; *i. e.*, application of the proper correcting glasses, and then, if necessary, resort to the measures above mentioned. "Anisometropia and astigmatism are the initial sources of the impossibility of binocular vision in the vast majority of cases. All strabismus is preceded by heterophoria. . . . All chronic or permanent strabismus is preceded by a stage of acute functional or incomplete strabismus. Intervene during the heterophoric or latent stage, and every case is preventable." H. W. Wooton³ lays great stress on the importance of insufficiency of divergence in convergent squint, believing that it is present in the vast majority of permanent cases, and when present seems to be the only factor requiring operative interference. He thinks it accountable for the angular deviations in most cases of permanent squint which have resisted the prolonged influence of a full correction. In view of these facts, the author strongly advocates advancement of both externi to the corneal margins without tenotomy of the interni in all cases of permanent strabismus in which insufficiency of divergence is present. C. Worth⁴ says the reason most surgeons content themselves with tenotomy is that the advancement operations commonly employed are very unsatisfactory and uncertain in their results. He describes an operation of advancement of the conjunctiva, Tenon's capsule, and the muscle tendon, following which he states that "he has had no relapse in any case in which he has advanced the external rectus by this method." "The immediate result is also the final result." Two separate sutures are made to include the upper and lower fourths of the tendon, each tied firmly, one end then carried forward and brought out at the corneal margin, and then tied back to the starting-point. [This operation offers a firmer grasp on the free end of the tendon than any we have seen, and also permits easy removal of the sutures when their work is done, which is no small consideration. Moreover, as the middle part of the muscle is not included in the sutures, its main blood-supply is not interfered with.] H. W. Wooton⁵ again describes his 3-suture advancement operation (illustrated in the "Archives of Ophthalmology" for May, 1901), and believes that it answers

¹ Med. Rec., Mar. 29, 1902.² Jour. Am. Med. Assoc., Nov. 1, 1902.³ Arch. of Ophthal., Mar., 1902.⁴ Ann. of Ophthal., July, 1902.⁵ Ann. of Ophthal., July, 1902.

all requirements of a powerful advancement operation that can be graded to suit variable degrees of squint. He finds that excision of more than 2 mm. of tendon leads to a rather disfiguring enophthalmus. In 80 cases he has done this operation with gratifying results. [It sounds, from the author's description, much more difficult of performance than Worth's operation.] W. C. Posey¹ calls attention to the associated head movements resorted to by patients with paretic or paralytic ocular muscles, and submits the histories of two young boys thus affected. Two cases of palsy of the superior oblique muscles are reported by Stanculeanu,² appearing after radical cure of frontal sinus disease by the method of Kuhnt. The author believes the palsy was due to operative injury and not to postoperative inflammation. In both cases Landolt did advancement of the superior rectus with excellent result, securing full binocular vision in one of them.

Enophthalmus.—R. Lederer³ states that the enophthalmus seen after traumatism is due to fracture of the orbital walls and hemorrhage into the orbital tissues with subsequent cicatricial contraction of the organized hemorrhages.

LENS.

Congenital Cataract.—The results in the two youths operated on by L. Ferri⁴ for congenital cataract show plainly that considerable reserve is necessary in estimating the results of operation in congenital cases if the complete blindness has not been preceded by a period of appreciable functional development. The best results follow the earliest possible operations.

Congenital Dislocation.—L. D. Brose⁵ has been having an experience with congenital displacement of the lens as studied in two families—a sister and brother and their children, numbering 7 cases altogether. As a result of this experience he advises that such cases be very carefully refracted. Failing in materially improving the vision by glasses, he recommends the determination, with the help of a mydriatic and a stenopaic disk, whether a small iridectomy will help matters; and if so, make one. If the patient is under 30, he advises discission of the lens; but if over 30, extraction should be done. S. Stephenson⁶ has collected reports of 33 cases of spontaneous resorption of cataract, and in more than half of them there was some complication—glaucoma in 7. Pathologic and especially glaucomatous eyes seem to be peculiarly favored with spontaneous disappearance of the cataract.

Reclination or Couching.—G. F. Suker⁷ points out that the obsolete operation of couching or depressing the opaque lens into the vitreous is worthy of consideration when one eye has been lost by extraction, and conditions point convincingly to the same result in the other eye. He further shows that the percentage of failures in the class of cases in which depression can be performed is not large, but, on the contrary, is less than

¹ Jour. Am. Med. Assoc., Nov. 4, 1902.

² Arch. d'Ophtal., Jan., 1902.

³ Arch. f. Ophthal., vol. LIII.

⁴ Annali de Ottal., vol. XXX.

⁵ Ophthal. Rec., Mar., 1902.

⁶ Jour. de Med. de Paris, Nov. 3, 1901

⁷ Am. Jour. Ophthal., June, 1902.

in the same class of cases operated on by iridectomy. Any disease of the retina or choroid is, of course, a positive contraindication. In an idiot 36 years of age, who had been blind for a year and a half, J. Hirschberg¹ did a couching or depression of the cataract into the vitreous. This was done because the unruliness of the patient made an operation under cocaine impossible, while narcosis was not feasible because of severe valvular disease of the heart. The recovery was complete under atropin and bandage, and useful vision was secured.

Postoperative Accident in Healing.—In a case of cataract extraction in which infection occurred on the seventh day, Roscher² carried the glowing end of a platinum tip well into the vitreous after the edges of the wound had been burned. Of course, this was done under ether, the application taking from 3 to 4 seconds, the depth of entrance being 4 to 8 mm. By this means he avoided enucleation and saved to the patient a shapely eye. [The method seems to warrant consideration. It certainly goes right to the spot without having to traverse the entire system, as do drugs.] H. Schmidt³ reports a very interesting case of cataract extraction in which, 36 hours after operation, hypopion and panophthalmitis appeared. Feeling that medicinal treatment in such cases is of no avail, Schmidt opened the anterior chamber, cleaned out the pus, and, introducing a small iodoform disk into the chamber, closed the eye. Improvement was rapid, and in a month the patient had vision of $\frac{1}{2}$ and could read ordinary print with +10 D. [This is one of the most favorable reports we have seen in the management of this formidable complication. It is such sound surgery as to commend itself to the discerning surgeon. We have had, personally, one instance of purulent infection with incipient panophthalmitis that made a complete recovery on hourly doses of $\frac{1}{100}$ gr. of mercury biniodid, 1 : 1000 formalin hourly, with atropin and ice, getting final corrected vision of $\frac{1}{2}$, so that the above measure would not seem entirely justifiable until vigorous medication had been tried for from 24 to 48 hours.] Neustatter⁴ reports a case in which extraction was done on a 61-year-old patient with conjunctival catarrh, in whom convalescence was normal until the third day, when erysipelas of the face and nose developed to which the patient succumbed several days later. De Wecker⁵ says that occlusion of the eyes after cataract operation is not well borne by many persons, particularly those suffering from catarrh and lacrimal troubles. In two of the latter type the only dressing used was a narrow band, applied vertically over the closed lids and retained in position by collodion on the cheek and forehead.

Secondary Cataract.—Wokenius,⁶ who has seen many dissections in Kuhnt's clinic, argues for subconjunctival dissection of secondary cataract. With the pupil dilated, the knife enters the conjunctiva 3 to 4 mm. from the limbus, passes on through the sclera and the utmost periphery of the anterior chamber on a plane with the iris into the capsular membrane, when by a sawing motion a horizontal cut is made in the

¹ Deutsch. med. Woch., No. 13, 1902.

² Zeitschr. f. Augenh., April, 1902.

³ Arch. d'Ophthal., June, 1902.

⁴ Münch. med. Woch., Mar. 25, 1902.

⁵ La Clin. Ophthal., Mar. 25, 1902.

⁶ Zeitschr. f. Augenh., April, 1902.

capsule from 7 mm. to 9 mm. long if possible. The knife is then withdrawn. The reaction is practically *nil*. In 216 secondary cataracts, not one infection occurred, and in no instance was vision made any worse nor did glaucomatous symptoms supervene. [These are very unusual figures—indeed, sufficiently so to make the author's claim worthy of the fullest consideration.]

THERAPY.

P. Morgano¹ has been using for **subconjunctival infection** a physiologic salt solution of complex identity, as follows: NaCl, 54.14 %; NaO₂, 11.02 %; K₂O, 4.62 %; CaO, 1.38 %; MgO, 0.21 %; SO (?), 2.39 %; P₂O₅ (?), 1.74 %; CO₂ (?), 17.79 %. Merck prepares these ingredients in the form of compressed tablets, soluble in hot water. The author prefers 1.5 % solution in hot sterile water (as they are isotonic with the blood), but 2 % solution can be used if a more revulsive action is desired. He believes they always produce a more or less marked improvement in inflammatory exudative processes in the eye. Moreover, he claims the improvement is rapid. These injections (generally 15 mm.) are of value in specific choroiditis and retinitis, also in retinal detachment, although they by no means guarantee against recurrence. Armaignac² finds that benzoate of mercury may be used subcutaneously and also under the conjunctiva without pain or other disagreeable symptom. His solution is: Mercury benzoate, gr. iv; ammonium benzoate, gr. xij; water, f℥j. In 3 cases of ocular syphilis intractable to other specific medication he got very good results from the use of the above solution subconjunctivally. [1 : 100 of any mercury salt seems rather strong for subconjunctival use.] Iodipin, a new iodine product, has been used subconjunctivally by Naegeli³ in 2 cases of scleritis, 1 of dendritic keratitis, 1 of neuroparalytic keratitis, 1 of choroiditis, and 1 of neuroretinitis, and he thinks the drug well worthy of trial. Darier⁴ continues to feel that in dionin we have the most important recent addition to our therapeutic agents. Introduced into the subconjunctival tissues it acts as a marked sedative through the periorbicular lymph-spaces, this effect not being produced by its absorption elsewhere. In the conjunctival sac it is analgesic, antiseptic, and a lymphagog with very feeble anesthetic powers. To its lymphagog properties may be ascribed its efficiency in hastening the absorption of the postoperative debris of cataract. He commends it particularly (in 2 % solution) to promote absorption of pupillary exudates and to favor mydriasis. Acute iritis not yielding to salicylate of soda or salol has proved quite amenable to aspirin in H. Kirschner's⁵ hands. The pain in these cases as well as in iridocyclitis seems to promptly disappear under 15 to 20 grains of the drug. More than 30 grains were never necessary. Thiosinamin (an alkylated urea) is again brought forward by G. F. Suker⁶ as a valuable drug in the treatment of corneal opacities, especially those due to exudate or infiltrate in the corneal stroma rather than those due to cicatrices. He finds it a marked tonic favoring absorption of exudates

¹ Annali di Ottal., vol. xxx, p. 692.

² Rec. d'Ophthal., Mar., 1902.

³ Arch. f. Augenh., vol. XLIV.

⁴ La Clin. Ophthal., Jan. 10, 1902.

⁵ Die ophthal. Klin., No. 18, 1902.

⁶ Jour. Am. Med. Assoc., Aug. 9, 1902.

and infiltrates, producing local reaction without systemic disturbance. It is given dry in 3-grain capsules once or twice a day. Von Sicherer¹ finds that the chief advantages of cuprol are its relatively slight irritating properties and its greater powers of penetration. He has found it of much value in chronic conjunctivitis and in the phlyctenular variety. Among the various silver preparations G. Hartridge² mentions actol, itrol, argonin, argentamin, nargol, largin, and protargol. He dismisses all but the last three as unworthy of consideration. Nargol in 5 % to 10 % solution causes no pain and is pleasanter to use than protargol. Largin's chief claim is that it contains more silver than any other synthetic preparation (11.8 %). Hartridge says he has had better results with this than with any other silver preparation in acute contagious conjunctivitis (Weeks). Protargol in 10 % solution equals a 2 % silver nitrate solution, but will need to be used in 20 % and 30 % solutions oftener than in the weaker solution. A 50 % solution has been very efficient in his hands in the treatment of trachoma. [Argyrol, which has been brought out in the American market (as silver vitellin), contains, it is claimed, 30 % of silver, is penetrating, powerfully bactericidal, and practically nonirritating. In the few cases in which we have used it (purulent conjunctivitis) the results have been very gratifying.] Adrenalin chlorid solution has been useful in de Schweinitz's³ hands in spring catarrh and in trachomatous pannus. It also facilitates the insertion of lacrimal probes. He has found that all suprarenal preparations sometimes produce irritation and occasionally secondary hyperemia. W. F. Macklin⁴ has compared the cycloplegic action of atropin and scopolamin, and finds them identical. In 1 % solution they are rapid, powerful mydriatics, and as cycloplegics quite as reliable as atropin. Homatropin he finds unreliable. He recommends the use of the above-mentioned cycloplegics in oily solution, and states in conclusion that under their use mydriasis begins in 10 minutes and is on the average complete in about 50, and the accommodation is restored in about 5 days. Kauffman⁵ remarks that inasmuch as suction rightly applied makes decided traction movement upon the whole eyeball, it seems applicable to embolism of the central retinal artery and to incipient optic nerve degeneration; also, in paresis of the ocular muscles.

OPTIC NERVE.

The absence of optic neuritis in intracranial tumor (especially pontine) before 40 years of age and its increasing frequency after that period is noted by H. D. Singer,⁶ who remarks that from a consideration of these facts "it would appear *prima facie* to be in some way dependent for its existence upon the condition of the vessel walls."

Optic Atrophy.—After commenting upon the usual concentric shrinking of the visual field in tabes, Jocos⁷ goes on to relate the details of 3 cases of tabes in which the fields were hemianopic. Vision, he re-

¹ Die ophthal. Klin., Dec. 5, 1901.

² Brit. Med. Jour., Nov. 2, 1901.

³ Therap. Gaz., July 15, 1902.

⁴ Arch. of Ophthal., Mar., 1902

⁵ Woch. f. Ther. u. Hyg. des Auges, No. 22, 1902.

⁶ Lancet, June 14, 1902.

⁷ La Clin. Ophthal., Mar. 10, 1902.

marks, is fairly good in these cases unless the fixation point becomes involved. H. Derby¹ advocates vigorous strychnin therapy (in the temple) in optic atrophy, carrying the drug to toxemia, then withdrawing it for a few days and repeating the treatment to toxemia again.

Toxic Amblyopia.—According to the exhaustive researches of J. P. Nuel,² the origin of retrobulbar neuritis is always double (in the nerve and in the retina), but the primary cause is in the nerve. A. Birch-Hirschfeld³ has made pathologic examinations of the eyes of a patient with chronic nicotin amblyopia which had been under observation over 7 years. The results point toward primary involvement of the nervous elements of the nerve and retina. He believes, also, that the ganglion-cell changes in the retina precede, or at least come at the same time, as the nerve-fiber degeneration, in which position he allies himself with Nuel and reverses the findings of Uthoff. H. Friedenwald's⁴ experiments on rabbits showed that ethyl and methyl alcohol have very similar effects. He does not venture an opinion as to whether these changes are primary or secondary. An exhaustive review of the whole subject of toxic amblyopias is made by G. E. de Schweinitz⁵ that is well worthy of the closest study. The study was not made with the idea of formulating any working conclusions, but more with the idea of bringing together the recent literature of the subject. C. A. Oliver⁶ offers a modification of the Abney pellet test for the ready detection of central scotomas, with which he states he can reveal in a moment or two the presence of color scotomas. He uses it simply to determine quickly and roughly the presence of color scotomas, after which careful perimetric study of the case can be made. H. V. Würdemann⁷ claims that without securing an authentic history and without observation for some weeks, or from one examination of a case, it would not be possible to state that "a certain case of blindness was or was not caused by methyl alcohol," as the ocular appearance, the state of vision, and the scotoma in the visual field are the same as in other forms of toxic amblyopia; but if in a certain case, proof were given of the ingestion or the inhalation of methyl alcohol, which was followed by vertigo, nausea, vomiting, and mental disturbances with sudden blindness, and which upon examination showed the objective signs above stated, not recovering as do usual alcohol and tobacco poisoning, the physician could be positive in stating that the cause of the blindness was methyl alcohol. H. Moulton's⁸ case (toxic amblyopia) was caused by the drinking of bay rum. Saturnine origin of optic atrophy is a comparatively rare condition. Gimbert⁹ saw this result supervene in a 29-year-old male who was a lead-worker. The blindness was relatively sudden in its development and partial recovery took place. Alcohol, tobacco, syphilis, and hysteria were all excluded, so that it seems like an instance of pure lead atrophy. F. C. Heath¹⁰ has seen permanent amblyopia occurring in a young woman who was daily exposed to the fumes of carbon bisulfid for a period of 3 months,

¹ Boston M. and S. Jour., May 15, 1902.

² Arch. f. Ophthal., vol. LIII, No. 1.

³ Ophthal. Rec., April, 1902.

⁴ Amer. Med., Dec. 21, 1901.

⁵ La Clin. Ophthal., Mar. 25, 1902.

⁶ Ann. of Ophthal., April, 1902.

⁷ Jour. Am. Med. Assoc., Nov. 30, 1901.

⁸ Ann. of Ophthal., July, 1902.

⁹ Jour. Am. Med. Assoc., Nov. 30, 1901.

¹⁰ Ann. of Ophthal., Jan., 1902.

when her sight had fallen from normal to $\frac{1}{80}$. Although there was no central scotoma demonstrable, the author is inclined to attribute the amblyopia to the carbon bisulfid. Two more instances of toxic amblyopia as the result of iodoform toxemia are recorded, this time by M. Mohr.¹ Both were tuberculous boys 13 years old, and both made good recoveries.

EYE IN GENERAL DISEASE.

A. Haig² lays great stress on "the importance of prominent eyeballs as a symptom of the increased blood-pressure which is the underlying cause of Graves's disease and other conditions in which this symptom is present. It not only tells of high blood-pressure, but often also how long it has existed and whether the heart has hypertrophied under it or failed." He goes so far as to claim that he can approximately gage the thickness of the left ventricle by the greater or less prominence of the eyes.

An analysis of 134 cases of episcleritis by W. Haerl³ showed, in those cases where the etiology could be worked out, syphilis to be responsible for 5 % of the cases, rheumatism 7.5 %, articular rheumatism 3 %, and in not one case could essential gout be found to be operative. He found farmers and laborers to be most often affected.

Recurrent subconjunctival hemorrhages have not, to de Schweinitz's mind,⁴ received the place the affection deserves among the ocular signs of nephritis. He urges that in every such case careful urinary analysis be made, as they are frequently "the little leaks announcing that a greater break is not far off." Of the same significance, he says, are the subcutaneous ecchymoses in the lower lids.

Diseases of the Blood and Arteries.—As probable causes underlying the amblyopia following profuse hemorrhage, Assicot⁵ mentions vascular spasm, endarteritis, lymph-stasis, and infection. Any one or all of the above factors may be at times operative. O. O. Hawthorne⁶ inclines to the view that double optic neuritis occurring in a patient who is the subject of chlorosis is due to intracranial thrombosis. In his case the ocular palsy and optic neuritis were, he thinks, undoubtedly due to some common cause, which he finally reasons out to be spontaneous thrombosis of some one of the cerebral sinuses.

The treatment of 20 cases of asthenopia associated with malaria convinces Hiers⁷ that there are two distinct forms of malarial asthenopia—acute and chronic; that fever does not necessarily accompany the condition; and that antimalarial treatment is necessary before the eye-symptoms are relieved.

Two instances of amblyopia of hepatic origin are recorded by Jacqueau.⁸ In both, all other intoxications were excluded with reasonable certainty. Under the usual hepatic treatment recovery was practically complete. An especial feature of the treatment was the use of sheep's liver, which has been so successfully employed by Trantas in hemeralopia.

¹ Ungar. med. Presse, Oct. 10, 1901.

² Inaug. Dissert., Giessen, 1900.

³ Arch. d'Ophtal., May, 1902.

⁴ N. Y. Med. Rec., Oct. 11, 1902.

⁵ N. Y. Med. Rec., Oct. 11, 1902.

⁶ Proc. Phila. Co. Med. Soc., Nov., 1902.

⁷ Brit. Med. Jour., Feb. 8, 1902.

⁸ La Clin. Ophtal., June 10, 1902.

W. L. Pyle,¹ in alluding to the way in which the **different ocular structures are affected in diabetes**, summarizes as follows: Glycosuria may be suspected in the following conditions: (1) premature presbyopia, (2) unexplained mydriasis or cycloplegia, (3) sudden change in the refraction, (4) intractable iritis, (5) cataract in young or middle-aged persons, (6) unexplained optic atrophy, (7) hemorrhagic retinitis, (8) sudden and marked amblyopia, particularly of the central variety.

A. T. Haight² agrees with Bock that **ocular tuberculosis** is by no means rare—that it frequently invades the uveal tract, and that the eye may be the seat of the earliest manifestation of what proves later to be a general infection. He is reasonably satisfied that at least 75 % of all ocular tuberculosis can be ascribed to either injury or infection from some other affected part of the body; and claims that in primary ocular tuberculosis early diagnosis and operation would save many lives. H. Friedenwald³ records two instances of probable tuberculosis of the iris, but in one inoculation experiments were negative, and in the other no inoculation was made, so that neither case is proved. Clinically, they certainly seem tubercular phenomena.

The influence of eye-strain on general health is pointed out by G. S. Hull. (See section on "Refraction," p. 517.)

Ziemsissen⁴ reemphasizes the fact that in **central nervous syphilis** the red and green fields may be quite contracted, while the form field remains normal in its limits. In some of his patients the increase in the red and green fields was marked under mercury, but quickly contracted again on the withdrawal of the drug. The more thorough the treatment and the longer it was continued, the better were the conditions of the visual fields.

Functional Neuroses.—That ametropia does occasionally cause epilepsy is, to George M. Gould's⁵ mind, beyond question by those who have studied the facts with a genuine scientific spirit. To the number of cases of this kind already reported he adds 6 cases, in which, he claims, the cure was immediate, certain, and complete, and has persisted for several years. W. Reber⁶ insists that there are certain cases of epilepsy that continue to have their seizures notwithstanding the most careful correction of their refraction; and goes on to say that some of these epileptics will lose their seizures when their muscular anomalies (usually exophoria or hyperphoria) are righted. Four cases are reported that have been thus treated and have been freed entirely of their epilepsy over greater or less intervals with absolutely no drug treatment. Two instances of hysteric monocular diplopia are recorded by M. W. Zimmerman,⁷ the one seen in a 15-year-old factory-girl whose left visual field showed partial reversal of the color fields, and the other in a 20-year-old single woman. Neither of them had any optical or mechanical cause within the eyes for the diplopia, nor was there any coarse disease of the central nervous system. G. M. Gould and A. G. Bennett⁸ have made

¹ Amer. Med., April 19, 1902.

² Amer. Med., July 5, 1902.

³ Amer. Med., July 5, 1902.

⁴ Ophthalm. Rec., July, 1902.

⁵ Amer. Med., Feb. 8, 1902.

⁶ Klin. ther. Woch., No. 44, 1902.

⁷ Penna. Med. Jour., Nov., 1902.

⁸ Amer. Med., Sept. 13, 1902.

careful examination of the refractive and muscular status of 68 epileptics, and found unsymmetric astigmatism 20 times more frequent than among an equal number of ordinary patients. [This is an astonishing percentage of unsymmetric astigmatism among these unfortunates. Of course, time only will tell just what the value of correcting their ametropia may be, but the figures are startlingly suggestive.] W. P. Marple,¹ discussing ocular vertigo, states that it is oftenest due to paresis or palsy of one of the ocular muscles. He remarks that while he has met with a few cases of ocular vertigo associated with ocular palsy, the number in which a muscular or refractive anomaly of the eye has been the cause has been very small. [This is a remarkable statement that is not supported by the experience of most oculists. Next to headache, vertigo is one of the commonest of the ocular reflexes. Indeed, it is rare not to find it in oblique or inverse astigmatism and in exophoria and hyperphoria.]

Autotoxemia.—Hennicke² speaks of 3 members of a family who ate freely of stale eggs which later induced nausea and vomiting. Twenty-four hours later there was complete suspension of accommodation in all of them. The father, who had not partaken of the eggs, was exempt. Bagnerio³ reports paralysis of accommodation occurring in a 15-year-old boy who had had an attack of mumps 3 weeks before. There was no other ocular complication and the paralysis was of brief duration.

Altland⁴ mentions the case of a child 3 days old with **ophthalmia neonatorum** who developed polyarthritis on the eleventh day, when the eye trouble was subsiding. The knee-joints were punctured and from the exudate numerous characteristics of the gonococcus were obtained.

Pick⁵ has noted **fundus changes** in 30 % to 40 % of cases of **cancer of the stomach**. The changes include grayish-white retinal plaques of various size and shape situated near the optic disk, retinal hemorrhages, and slight edema of the optic nerve-heads.

In the recent **epidemic of plague** in Plautua, F. P. Maynard⁶ observed ocular complications in 12. Chief among these are hazy or sloughing cornea, many forms of iritis, and scleral staphyloma.

CORNEA.

The fact that the **corneal epithelium may take on a fluorescein stain** and yet no ulcer be present is stated by A. H. Benson,⁷ although he goes on to say that when the cornea does stain it is usually strong evidence either of an ulcer not yet covered with epithelium or abraded epithelium or epithelium in a dead or diseased condition. C. J. Kipp's⁸ treatment of a **corneal ulcer** is rather mixed, although he resorts to actual cautery when perforation threatens. De Schweinitz⁹ says that when he is dealing with **pneumococcus infection** he curets and uses the cautery with iodoform; in less virulent cases he falls back on tincture of

¹ Jour. Am. Med. Assoc., Nov. 15, 1902.

² Woch. f. Ther. u. Hyg. des Auges, No. 23, 1902.

³ La Clin. Ophtal., June 10, 1902.

⁴ Klin. Monatsb. f. Augenh., April, 1902.

⁵ La Clin. Ophtal., Jan. 25, 1902.

⁶ Indian Med. Gaz., quoted Ann. of Ophthal., Jan., 1902.

⁷ Ophthal. Rev., May, 1902.

⁸ Jour. Am. Med. Assoc., Aug. 9, 1902.

⁹ Ibid.

iodin and carbolic acid. Randolph and Risley speak of the splendid properties of holocain, and also indorse iodin and carbolic acid. S. Theobald¹ objects to the actual cautery that it may produce permanent opacity of the cornea and easily lead to unintentional opening of the anterior chamber. In its stead he recommends the application under cocain of pure carbolic acid to threatening corneal ulcers, guarding carefully against its spread to the normal tissues and flushing the eye with normal saline or boric acid solution after the acid had been allowed 5 minutes to act. It produces instantly a milky scar, which, however, speedily disappears.

Interstitial Keratitis.—Puesh² believes that to the triad of symptoms alluded to by Jonathan Hutchinson (notched teeth, keratitis, and deafness) should be added an arthritis that especially affects the knee-joints. Of 27 cases of specific interstitial keratitis, 11 had this arthropathy, while but 5 had deafness. In view of the opinion generally held that corneal disease is never due to acquired syphilis, W. H. Wilder³ submits 3 case-histories that seem to controvert the general opinion. Risley⁴ makes the point that these conditions may be only the manifestation of a latent syphilis that has for some reason been aroused.

As de Schweinitz⁵ observes, at longer or shorter periods after the apparent healing of trivial corneal abrasions the affected eye may become the seat of irritative phenomena quite out of proportion to the original injury. Briefly outlined these cases assume one of 3 types: namely, traumatic bullous keratitis with many relapses, typical relapsing erosion preceded by vesicle formation, and characteristic erosion without demonstrable vesicle formation, the vesicle in all probability having disappeared on each occasion before the patient came for examination. All kinds of treatment have been recommended, but careful attention to the general health, holocain locally, and tincture of iodin to any obstinate erosions seem to secure the best results.

An unusual case of recurring **superficial punctate keratitis** is recorded by W. C. Posey⁶ occurring in a young colored man one month after an attack of gonorrhea, but probably independent of the latter affection. The peculiar features of the case were the quite dissimilar appearance of an inflammation, undoubtedly of the same type, occurring in the same eye within such a short time, the keratitis taking the form in the first attack of ring ulcers in both eyes leaving no traces, and in the second of superficial whitish dots and epithelial proliferations upon the surface of both corneas; also the limitation of the disease to the superficial layers of the cornea.

Cases of **herpes zoster ophthalmicus** are fully detailed by W. C. Bane,⁷ who points out how easily it may be confounded with facial erysipelas. For the clearing of opacities of the cornea caused by lime burns, H. Guillery⁸ recommends ammonium chlorid in 2 % solutions, applied as an eye-bath half an hour daily.

¹ Am. Jour. Med. Sci., June, 1902.

² Jour. Am. Med. Assoc., Dec. 21, 1901.

³ Ophthal. Rec., Feb., 1902.

⁷ Jour. Am. Med. Assoc., Dec. 21, 1901.

² Arch. d'Ophthal., Nov., 1901.

⁴ Ibid.

⁶ Ann. of Ophthal., Jan., 1902.

⁸ Arch. f. Augenh., XLIV, 1902.

OPERATIONS.

Attannasio¹ has been making exhaustive experiments with the **anti-streptococcus serum of Marmorek**—both curative and preventive. He thinks it preferable as a preventive to all other means. It is applicable to all cases, is without danger, and permits immediate operation. Its action may be ascribed to various factors, such as neutralization of the toxins in the circulation, lessening the virulence of the streptococci and other agents in inflammation, or it may confer on the organism increased power of resistance to infection. The author concludes as follows: (1) Marmorek's serum has a marked therapeutic effect in many inflammatory processes both intraocular and extraocular. (2) It has a special preventive action on postoperative infection. When the latter is to be feared, injection should be made before operation and continued until a cure is established. (3) The serum has a marked and immediate action on inflammatory pain. (4) It seems to accelerate the healing of operative incisions. (5) It is absolutely harmless, produces no albuminuria, and has no injurious nervous effects even when used for a long time in large doses. (6) Its best effects are secured by the earliest possible use in large doses in inflammatory affections. Masugi² contends that cocaine muriate effects changes in the corneal epithelium and disturbs karyokinesis, thereby retarding the healing process in wounds after operation.

J. E. Weeks³ describes an operation for establishing a **culdesac for an artificial eye** which he says has been very successful in 5 cases. [The establishment of a good culdesac after cicatricial contraction has taken place is so difficult a task that all operators are recommended to read carefully Weeks's description of his own technic.]

For **quick, effective suturing of the tendons**, including capsule and conjunctiva, after enucleation, F. C. Todd⁴ first dissects up the ocular conjunctiva in the usual manner and then introduces 4 sutures through conjunctiva, capsule, and tendon, as shown in Fig. 82, all of which are tied together, making a purse-string suture. In striving after the **ideal conjunctival stump**, Rohmer⁵ injects a mixture of vaselin and paraffin a reasonable time after the enucleation, and claims fine results, as the injected material is not absorbed. To **obviate the extrusion of the smooth metallic ball** so frequent after implantation operations, O. Landmann⁶ uses a ball made of 7 complete vertical circles of silver wire and 3 horizontal ones, all soldered at their intersections. Three sizes are used, 11, 12, and 13 mm., over which the conjunctiva and muscles are securely tied. The advantages claimed are lightness and solid retention within the orbit by the granulation tissue which springs up between the wires, binding the ball down permanently.

Penetrating Wounds.—At the 1902 meeting of the American Medical Association, Haab,⁷ of Zurich, Switzerland, offered statistics of 165 cases

¹ Arch. di Ottal., vol. ix.

² Jour. Am. Med. Assoc., Aug. 23, 1902.

³ Rev. Med. de l'Est., June, 1902.

⁴ Klin. Monats. f. Augenh., Aug., 1901.

⁵ Ophthal. Rec., May, 1902.

⁶ Am. Jour. Ophthal., May, 1902.

⁷ Jour. Am. Med. Assoc., Aug. 30, 1902.

of penetrating foreign bodies, of which 141 were extracted by the giant magnet. Of this number 39 eyes went on to enucleation, either because of infection or chronic iridocyclitis; 51 eyes were restored to good and useful vision. Haab feels that the giant magnet is superior to all other magnets because it does not interfere in any way with the vitreous—of which he seems to stand in great awe. Miles Standish¹ reports 8 cases in which the giant magnet was successful 7 times. W. M. Sweet² contends that the size of the foreign body and its approximate position in the eyeball should be known before attempting extraction either by the giant or medium-sized magnet; and that the x-rays are the most certain method of such diagnosis. Negative findings with magnets cannot be accepted as conclusive evidence of the absence of foreign bodies. While the giant magnet is superior for extracting by way of the anterior chamber, its great power necessitates caution in its use. Opening of the vitreous is harmful, and should be done only when other attempts have failed; but when necessary, the smaller magnets are quite as effective for this method of extraction as the giant magnet. He continues³ to champion x-ray lo-

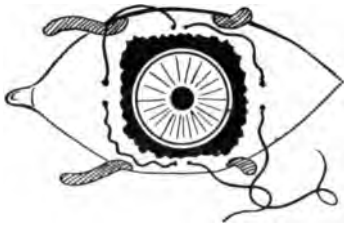


Fig. 82.—Todd's method of suturing the tendons in enucleation (Ophthal. Rec., May, 1902).

calization, in testimony whereof he submits 65 localizations. Out of 45 of these, extraction was successful in 38 and failed in 7. His opinion is that more extended use in the future of the larger magnets will probably achieve better visual results than have been obtained in the past with the small magnet introduced into the vitreous. Extraction with forceps and the employment of normal salt solution to replace lost vitreous gave a good cosmetic result

in several instances, and is an operation worthy of trial. S. D. Risley's⁴ opinion is that in the present state of our experience, in the absence of definite knowledge as to the presence or exact location of a metallic fragment, the **giant magnet** is a great aid; but that, given the knowledge afforded by the skiagraph, the less powerful magnets are sufficient, less costly, and more convenient in the daily routine of office and hospital practice. It remains to be shown by extended statistics which method will best conserve the integrity of the eye. D. M. Campbell⁵ heartily indorses Sweet's method, and is convinced from his 8 cases of the value of the x-ray in determining operation in injured eyes. In referring to his last 10 cases of penetrating foreign bodies, A. Barkan⁶ says he has been able to get along satisfactorily without the x-ray, relying upon the giant magnet to find the foreign body and then extract it, in which he has not failed a single time, thus far. W. T. Spicer and A. T. Macallen⁷ also find the Haab magnet of valuable diagnostic service, but insist that x-ray localization is extremely important, as it

¹ Ibid.

² Ibid.

³ Phila. Med. Jour., Feb. 1, 1902.

⁴ Amer. Med., Sept. 12, 1902.

⁵ Ophthal. Rec., Aug., 1902.

⁶ Arch. of Ophthal., Jan., 1902.

⁷ Brit. Med. Jour., Jan. 18, 1902.

sometimes obviates injury to a clear lens in the extraction of a foreign body. The method they prefer is to bring the foreign body forward with Haab's magnet and then remove it from the anterior chamber with the small hand magnet. They warn against bringing the patient up to the giant magnet too suddenly for fear of entangling the foreign body in the iris or ciliary body. S. Turk¹ claims that our ideas of the relative utility of the Haab and Hirschberg magnets have been based upon clinical results only, and that we are not altogether clear as to the power of the two instruments, nor their scope. His feeling is that the small magnet may be used when, without injuring the vitreous, it can be brought within a few millimeters of the foreign body. When the intruder is in the anterior or posterior chamber or in the iris or lens, this can be accomplished by making a corneal section. In the case of deeper-lying foreign bodies the large magnet should be used, extracting always at the greatest possible distance from the magnet. Fatal issue is recorded by Roemer² occurring 48 hours after enucleation of a purulent hydrophthalmic eye in a girl of 12. Postmortem was refused.

Sympathetic Ophthalmitis.—In previous researches Gasparrini established the fact that inoculations of attenuated cultures of the diphtheria bacillus in one eye of the rabbit led to an inflammatory process in the other eye very similar to sympathetic ophthalmia in man. Two recent clinical cases³ have further convinced him that the sympathetic affection is due to the action of toxins generated by the bacteria rather than to the bacteria themselves. In sympathetic irritation there is a neuritis due to local infection from some microorganisms which generate toxic products, and these toxins are duly eliminated by the kidneys. The amount eliminated therefore is larger when the pathologic condition of the eyes is most marked. Those toxins which reach the optic nerve induce inflammation in it, and possibly also in the ciliary body. These facts indicate that sympathetic ophthalmitis is not a general affection but is localized in the eye because of a nervous irritation proceeding from the eye first affected. Gasparrini believes that his experiments on rabbits have abundantly confirmed this assumption. Galezowski⁴ inveighs against the preservation of ocular stumps that are likely to cause sympathetic ophthalmitis, and also condemns tattooing along with the many substitutes for enucleation. He evidently feels that enucleation is the only safe procedure. De Wecker⁵ disputes the position recently taken by Schirmer "that sympathetic ophthalmia is not complicated in general with morbid processes elsewhere," and offers 4 cases in rebuttal. De Wecker believes that in all of these the deafness was the result of a migration of microorganisms along the optic nerves to the auditory nerves, producing changes in the middle ear, similar to those that existed in the eye.

Tattooing.—J. L. Borsch⁶ believes that many patients who are now wearing artificial eyes could have retained their natural eyes if the possi-

¹ Arch. of Ophthal., Mar., 1902.

² Klin. Monatsb. f. Augenh., April, 1902.

³ Ann. di Ottal., vol. xxx.

⁴ Rec. d'Ophthal. Aug., 1902.

⁵ Ann. d'Oculist., Oct., 1901.

⁶ Ophthal. Rec., Sept., 1902.

bilities of tattooing were better known. He describes in full detail the method as developed by de Wecker and Masselon, who are the high priests of corneal tattooing.

Promiscuous enucleation is strongly discountenanced by de Wecker.¹ Malignant tumors and incipient or developed sympathetic ophthalmitis are, to his mind, the only absolute indications for enucleation. He advocates tattooing of corneal leukomas, and if the deformed eye is sunken, division of the recti muscles, to allow the globe to come forward. The results thus secured seem to him vastly better than the best-fitting artificial eye.

CHOROID.

H. D. Bruns² declares that there **cannot be any such disease as serous iritis**. Descemetitis, on which the diagnosis of serous iritis was long made to rest, is most frequently the principal symptom of the outbreak of an acute plastic (exudative) choroiditis. The latter is generally overlooked because few cases of iritis or cyclitis are subjected to careful ophthalmoscopic examination after recovery and the complete disappearance of vitreous opacities. Much reflection on 53 cases of descemetitis (keratitis punctata) leads H. Friedenwald³ to state that it occurs in every case of iritis and is an almost constant sign of exudative choroiditis, and is convinced that in a large proportion of cases ordinarily diagnosed as serous iritis and serous cyclitis, the true pathologic condition is exudative choroiditis. H. F. Hansell⁴ says that while injuries to the ciliary zone are always serious, the syphilitic, diabetic, or tubercular diathesis delays their recovery beyond the average time, and lends gravity to the ordinary prognosis. Energetic treatment of the diathesis is therefore always in order. In what manner influenza, syphilis, gonorrhea, tuberculosis, scrofula, anemia, lithemia, and pelvic and rhinolaryngeal conditions cause iridocyclitis or uveitis has not been carefully determined, says de Schweinitz.⁵ But it does not seem unreasonable to assume that it represents an effort on the part of the uveal tract to expel from its tissues some toxin, bacterial or otherwise, precisely as certain forms of dermatitis represent an effort of the skin to eliminate poisonous agents. "We may say the uveal tract sweats, as does the skin," and on this basis he accounts for the curative action of pilocarpin in uveitis. H. Harlan's⁶ 37 cases show as possible causes the establishment of menstruation, abnormal menstruation, intestinal disorders, acute infections, and nasopharyngeal disease. Cases of obscure etiology show greater tendency to relapse than the others. W. H. Wilder⁷ says that severe inflammation of any part of the uveal tract may extend to the whole membrane. In choroiditis centralis and chorioretinitis changes in the vitreous may precede the uveitis. T. A. Woodruff⁸ believes that in uveitis few remedies are of much value: but of them all, the most efficient is the hypo-

¹ La Clin. Ophtal., May 25, 1902.

² Jour. Am. Med. Assoc., Sept. 27, 1902.

³ Jour. Am. Med. Assoc., Sept. 20, 1902.

⁴ Amer. Med., June 21, 1902.

⁵ Arch. of Ophthal., Nov., 1901.

⁶ Jour. Am. Med. Assoc., Sept. 27, 1902.

⁷ Ibid.

⁸ Ibid.

dermic injection of pilocarpin in conjunction with the internal administration of potassium iodid.

Sarcoma.—Three new cases of melanosarcoma of the choroid are recorded this year—one by F. Krauss,¹ found in a woman of 35, enucleated 2½ years ago without recurrence or metastasis; another by H. V. Würdemann,² as seen in a manufacturer aged 52, in whom the growth of the tumor followed one year after. In this case, also, no recurrence has been observed 2 years after enucleation. A case of choroidal sarcoma is described by Fehr³ in which both the iris and the membrane of Descemet were covered with fine pigment points arranged either in lines or little patches.

RETINA.

Retinitis Pigmentosa.—From a study of 383 institution deaf-mutes, Mulder⁴ advances the hypothesis that hardness of hearing, deaf-mutism, retinitis pigmentosa, and idiocy are all symptoms of one and the same disease which is located in the central nervous system. Each of these symptoms may exist throughout life, or two or more may be present simultaneously. Thus, we may have partial or total deafness with or without retinitis pigmentosa. Consanguinity favors the primary cause from which these conditions arise. [We have recently seen 2 brothers, Hebrews and deaf-mutes, both the subjects of retinitis pigmentosa. In this case the mother and father were cousins.] Trantas's⁵ list of cases of pigmentary degeneration of the retina successfully treated by ingestion of boiled or roasted sheep's liver reaches 40. The last 24 cases occurred in an orphanage, and were cured in periods varying from 1 to 6 days; ½ pound of the liver was eaten daily. Later, to prevent relapses, liver was given at intervals. He claims that chronic cases, even of years' standing, have responded readily to this form of treatment when all other means have failed.

Vascular Disturbances.—In discussing the various causes that lead up to obstruction of the central artery, A. H. Thompson⁶ points out that so long as the endothelium of an artery remains intact, healthy blood, even though it be stagnant, does not clot in it; it is only when the intima becomes disintegrated that this happens. He further adds that many cases of obstruction are probably due to disease of the vessel-walls, while some, at any rate, are certainly due to spasm of the muscular walls of the arteries. The 5 cases of transient monocular blindness reported by Posey⁷ are attributed to spasm of the retinal vessels of obscure origin. Van Duyse⁸ tells of a 71-year-old man who, while leaning forward, noticed sudden blindness in one eye, and almost immediately afterward in the other. Bilateral embolism of the central artery was found. There were no prodromes of any kind. The blindness was permanent.

¹ Ann. of Ophthal., July, 1902.

² Centralbl. f. prak. Augenh., May, 1902.

³ Trans. Netherlands Ophthal. Soc., 1902.

⁴ Arch. d'Ophthal., Nov., 1901.

⁵ Jour. Am. Med. Assoc., May 31, 1902.

⁶ Ann. of Ophthal., July, 1902.

⁷ Ophthal. Rev., Mar., 1902.

⁸ Arch. d'Ophthal., Feb., 1902.

Retinal Detachment.—In the matter of subconjunctival injections of normal saline solution in retinal detachment, R. Randolph¹ only goes so far as to say that their tendency is to do good. One of his 2 cases—a fresh detachment—offered a particularly favorable opportunity for testing the value of the method, and while the immediate result was good, it proved transient. Randolph justly counsels withholding from publication any and all accounts of cure in these cases until at least a year has elapsed from the time of the apparent cure. In the discussion following this paper, Risley, Knapp, and Holmes agreed with Randolph, while de Schweinitz spoke very favorably of the method. Maraval² claims that electrolysis is one of our most valuable therapeutic measures in the treatment of retinal detachment, especially when combined with subconjunctival injections of 1 : 2000 mercuric chlorid solution. He employs a 5-milliamperere current, passed for one minute's time and controlled by a rheostat. The injections should be commenced 4 days after the electrolysis, and seem, he says, to maintain the effect of the electrolysis. Compression bandage is also used for 4 days, also confinement to bed for from 4 to 6 weeks. Ten cases are reported, 2 having been cured and the remainder benefited. [As none of these cases seems to have been cured for any considerable length of time at the time the report was written, Maraval's claims must be waived.] In 8 cases Gallus tried the method of Dorr³; that is, scleral puncture and subconjunctival salt injections with leeching and decubitus. Gallus expresses some skepticism as to the permanence of his surprisingly good results, as several of the cases suffered relapse. He contends, however, that this method is far ahead of those formerly in vogue.

Pseudoglioma.—G. E. de Schweinitz and E. A. Shumway⁴ give a histologic description of an eyeball, removed from a boy aged 2, which had presented all of the clinical symptoms of glioma of the retina, but on opening the eyeball, a thickened and detached retina was found without distinct tumor formation. The authors were finally compelled to conclude tentatively that the condition found was due to dropsical degeneration of the nuclei of the external nuclear layer of the retina.

CONJUNCTIVA.

Classification.—The claim is again made that the various forms of conjunctivitis can now be classified bacteriologically—that is to say, etiologically—instead of clinically, as we still do. This time the claim is made by G. Corsini,⁵ of Padua, Italy, who has investigated thoroughly the whole subject and concludes that microscopic examination of the conjunctival secretion is of great value in diagnosis, and often absolutely necessary. When such examinations are unsatisfactory, doubts may be cleared up by culture studies on various mediums. He goes so far as to say that the bacteriologic report is a sure means of classifying the affec-

¹ Jour. Am. Med. Assoc., Oct. 11, 1902.

² La Clin. Ophtal., Sept. 10, 1901.

³ Zeit. f. Augenh., Dec., 1901.

⁴ Am. Jour. Med. Sci., Dec., 1901.

⁵ Arch. di Ottal., 1902, p. 17.

tion; cases that clinically point one way will prove bacteriologically to be an attenuated form of quite another kind of conjunctivitis. He finds it easy to deal with diplobacilli, streptococci, and staphylococci, but to detect the pneumococcus and pseudodiphtheric forms special care is demanded. [A magnificent bibliography accompanies this article.]

Acute Catarrhal Conjunctivitis.—According to E. A. Shumway,¹ the **Koch-Weeks bacillus conjunctivitis** is apparently becoming more common in Philadelphia than has been hitherto observed. The inflammation may be quite severe and accompanied by phlyctenules, and even by corneal ulcers; and as it is especially contagious, extra precautions should be taken to prevent its spread. Silver nitrate, 2 %, has been the most effective agent in his hands. In 76 cases of acute catarrhal conjunctivitis, Pes² found 29 cases of mixed infection and 47 of what he calls genuine infection. He views the diphtheria bacillus, the xerosis bacillus, and the bacillus of Weeks as varieties of a single germ which assumes under varying conditions a varying virulence. Gifford,³ commenting on this heterodox view, finds it difficult to accept Pes's conclusions as to the Weeks bacillus, but is inclined to support his contention as to the others. Since the Koch-Weeks bacillus grows more luxuriantly in conjunction with other germs in the conjunctival sac, Rimivitch⁴ supposes that it absorbs some material, probably globulin, from the other bacteria.

Diphtheric Conjunctivitis.—As the result of the study of a large number of cases, S. Stephenson⁵ advises liberal and early doses of anti-toxin with 1 : 5000 mercuric chlorid to the conjunctiva. He believes that croupous and diphtheric conjunctivitis are clinically and bacteriologically the same disorder, in which opinion he is joined by W. H. Jessup,⁶ who affirms that membranous conjunctivitis, while a most convenient term, must be made for the present to include cases due to diphtheria and other germs.

Purulent Conjunctivitis.—From an experience with 12 cases of gonorrheal conjunctivitis with corneal complications, H. C. Parker⁷ concludes that Saemisch's incision, made early, is the best treatment, as it preserves more clear cornea than any other method. But one eye was lost; the other 11 became what may be safely called useful eyes. Comparing these results with 12 other cases in the same hospital under medicinal treatment only, he finds the results from the Saemisch much superior.

Granular Conjunctivitis.—Morax (Paris) and Lakah⁸ (Alexandria) have examined the eyes of 63 nursing infants in Alexandria, Egypt. They were mainly abandoned children of European parentage in the care of native nurses. Fourteen (22 %) exhibited trachomatous lesions. Of the 14 nurses in charge of these children, 8 were suffering from acute trachoma, 5 showed cicatricial scars, and 1 had normal conjunctivas.

¹ Phila. Med. Jour., April 26, 1902.

² Ophthal. Rec., 1902, p. 552.

³ Brit. Med. Jour., Mar. 22, 1902.

⁷ Ophthal. Rec., April, 1902.

² Arch. f. Augenh., vol. xlv, No. 3.

⁴ Abst. Phila. Med. Jour., June 14, 1902.

⁶ Ibid.

⁸ Ann. d'Oculist., Nov., 1901.

The mode of infection in 8 % of the children was thus plain; of the remainder, the infection was readily traced to children or adults in the family of the nurse, the transmission being due to crowded quarters and uncleanly habits. The authors believe that practical prophylaxis consists in the artificial feeding of infants and the separation of the infected from the noninfected children during school-life. They assert that climate and race have absolutely nothing to do with the diffusion of the infection. Goldzieher¹ defines trachoma very well as "a chronic infiltration of the conjunctiva and tarsus with lymphoid masses, combined with abnormal secretion from the conjunctiva." Catnarovicz,² reviewing the history, topography, and treatment of trachoma, advises cleanliness, good food, and fresh air, to which are to be added irrigation of the conjunctiva and lacrimal passage with benign washes. For large vascular granulations with much secretion he holds steadfastly to silver nitrate, while for the small hard ones he employs copper sulfate. Hummelshelm's³ experience with jequiritol confirms that of Rohmer and Krauss, in that it is an agent with all the properties of jequirity, but superior to it in accuracy of dosage and absence of injury to any of the ocular structures. Lapersonne,⁴ too, agrees with Rohmer that jequirity cures the pannus of trachoma by producing a leukocytic thrombosis of the fine veins of the conjunctiva and cornea. He has found abrin solutions unreliable, and prefers 1 : 20 infusion of the drug, to be rubbed on the conjunctiva with a cotton applicator. Melconian⁵ uses in the second stage of trachoma a solution of metallic iodine in fluid vaselin, 1 : 200 to 1 : 400, which is well rubbed over the everted lids. He claims that it is equal to, if not more efficient than, copper and leaves no scars. [The latter is certainly a weighty argument.] For trachomatous pannus, Lor⁶ applies an electrolytic needle around the entire corneal limbus, destroying a zone 3 mm. or 4 mm. wide. He prefers this method to jequirity because it can be better controlled.

Vernal Catarrh.—Demicheri⁷ found spring catarrh 20 times in 5500 ophthalmic cases. He differentiates it from trachoma by the clean line separating the morbid papillary process on the tarsal conjunctiva from the sound conjunctiva. There is great tendency to congestion of the eye from the slightest causes. All improved under white precipitate ointment, but electrolysis seemed to have the most beneficial effect.

In the form of **conjunctivitis seen with hay-fever** E. Franke⁸ has secured the best results from holocain and colored glasses, the latter for the photophobia.

Pterygium.—According to Trapesontzian,⁹ pterygium usually begins as a pinguecula, as demonstrated by the presence of the debris of the latter, hyaline degeneration affecting both the hypertrophied connective tissue and the elastic fibers; pterygium may not be preceded by pinguecula, but it has the same pathology as if it had. He also states that it is

¹ Wien med. Woch., Mar. 1, 1902.

² Zeit. f. Augenh., April, 1902.

³ Klin.-ther. Woch., No. 8, 1902.

⁴ Rev. Med. del Uruguay, No. 5, 1902.

⁵ Arch. d'Ophthal., Oct., 1901.

⁶ La Clin. Ophtal., Sept. 25, 1901.

⁷ La Clin. Ophtal., Dec. 10, 1901.

⁸ Ann. d'Oculist., Mar., 1902.

⁹ Zeit. f. Augenh., Dec., 1901.

impossible to say whether pterygium is the result of active proliferation of connective tissue or is due to passive accumulation of tissue occasioned by the movements of the eyelid.

LIDS.

To A. Hala's¹ mind, **chalazion**, from an etiologic point of view, is an infectious process. The bacilli that are regularly found in the **chalazion** are in every way identical with the so-called xerosis bacillus, so commonly found in the conjunctiva. They get into the tissues by rubbing, and when once in the lid give rise by their multiplication to the process called **chalazion**. He dismisses the idea that **chalazion** is either a retention cyst or a tubercular process.

W. C. Posey's case of **tertiary ulcer of the lower eyelid** occurred in a hale, strong woman aged 52, mother of 5 sound children, and without any specific history. The rapidity with which the ulcer cleared up under vigorous mixed treatment left little doubt as to the diagnosis.

NEW INSTRUMENTS.

As H. F. Hansell² says, the **Thorner stationary ophthalmoscope** will never replace the hand instrument, because of its size, great weight, inferiority in the study of the lens and vitreous opacities, and its indifferent measurement of refraction. Nevertheless the stationary instrument has great merit, and is almost indispensable to those interested in ophthalmoscopy and the teaching of the same. Much use of the instrument has forced Hansell to modify to a certain extent his former conception, as obtained through the hand ophthalmoscope, of the retina and choroid in health and in various fundus diseases.

A **self-illuminating electric ophthalmoscope** is offered by G. F. Suker³ that ought to prove very serviceable in ward and other bedside work. The source of light is a 2-candle electric lamp from a 4-volt battery. It gives a large field of illumination with good penetration (Fig. 83).

The same author⁴ employs a **new enucleation forceps** (Fig. 84) for the easier removal of the globe in such operations, especially in soft and collapsed globes. They will no doubt prove useful.

LACRIMAL AFFECTIONS.

E. Roehlmann⁵ claims to have proved histologically **trachoma of the lacrimal sac**, thus explaining the frequency of acute dacryocystitis in trachoma. The follicles are responsible for the obstinate recovery in this form of dacryocystitis and furnish a new argument for the extirpation of the sac. Antonnelli⁶ is much in favor of gelatin sounds of protargol in

¹ Zeit. f. Augenh., Nov., 1901.

² Ophthal. Rec., Aug., 1902.

³ Deut. med. Woch., p. 747, 1901.

⁴ Amer. Med., Feb. 1, 1902.

⁵ Ophthal. Rec., Jan., 1902.

⁶ Ann. d'Oculist., Oct., 1901.

affections of the lacrimal passages. Complete section of the canaliculus is indispensable, division of the stricture often useful. Sounds equal to No. 4 caliber are the size ordinarily employed, and they are to be preceded by a No. 5 metallic sound. As the result of removal of the lacrimal gland, D. J. Blok¹ reports very annoying conjunctivitis, more intense in the evening. A sticky irritating fluid was secreted, accompanied by photophobia. Struyken² had done this operation 18 times, and observed conjunctivitis after 3 of them. The latter was cured, however, by treatment directed to the nose.

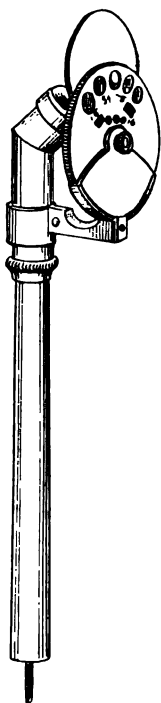


Fig. 83.—Suker's self-illuminating ophthalmoscope (Ophthal. Rec., Aug., 1902).

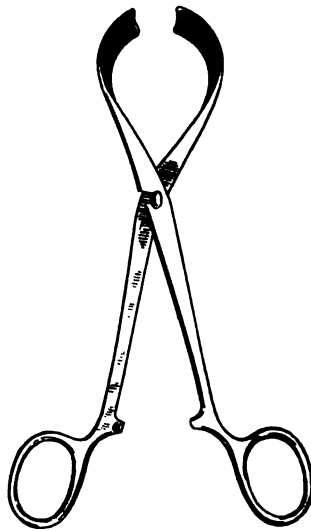
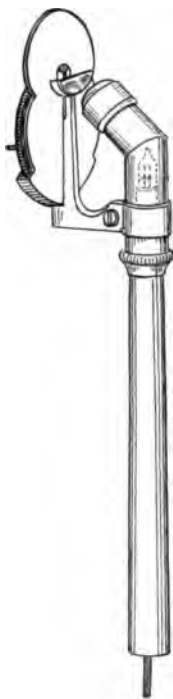


Fig. 84.—Suker's enucleation forceps (Ophthal. Rec., Jan., 1902).

New Growths.—A. S. Warthin³ affirms that the great majority of the lacrimal tumors described in the literature under widely differing heads are most probably mixed tumors of endothelial origin. These growths partake more of the nature of mature connective-tissue tumors. He suggests the designations "myxochondroma endotheliale," or "chondroma endotheliale." Fromaget⁴ records 3 additional instances of tumor of the lacrimal gland. The first was a sarcomyxofibroma, the second a tubular epithelioma, and the third a hydatid cyst. To the present literature of adenoma of the lacrimal caruncle, C. A. Veasey,⁵

¹ Trans. Netherlands Ophthal. Soc., 1901.

² Ibid.

³ Arch. of Ophthal., Nov., 1901.

⁴ Arch. d'Ophtal., Nov., 1901.

⁵ Ann. of Ophthal., July, 1902.

adds the history of another case studied in a widow aged 57 and diagnosed under the microscope as adenoma.

GLAUCOMA.

Etiology and Pathology.—Troncoso¹ (Mexico), from clinical and experimental researches (on rabbits), is convinced that alterations in the quality of the intraocular fluids is the important factor in the production of glaucoma. In conjunction with chemists he has found that the density of the aqueous humor is always raised in glaucoma, likewise the mineral and organic equivalents of the aqueous. Vascular change, he thinks, precedes and explains the increased albuminous deposit. He says he has detected a network of intracellular canals in the normal vitreous humor which in glaucoma are closed by condensation of the hyaline substance, resulting in augmentation of the volume of the vitreous. This increase, by pushing forward the ciliary body and iris and thus closing the filtration angle, aggravates and prolongs the increased tension due to the difficult exosmosis of the hyperalbuminous aqueous fluid. He believes in iridectomy and posterior sclerotomy, but not in anterior sclerotomy. Eserin is valuable, while sympathectomy is but transitory in its effects. As the result of a large number of experiments on animals, E. B. Coburn² concluded that intraocular changes may be induced by deleterious substances in the circulation, causing congestion of the ciliary body and iris; and then vesicle formation in the ciliary region, followed by fibrinous exudate into the anterior and posterior chambers. This blocks up the exit at the angle and favors increase of tension. When the irritation is brief, the exudate may be absorbed and the tension return to normal. If the irritation is sufficiently prolonged or intense, glaucomatous iritis with its attending evils may ensue. Panas³ reviews the pathogenesis of glaucoma and supports the retention theory. He believes the effect of iridectomy may be similar to the beneficial effects of simple laparotomy and the abortive treatment of orchitis by dissection of the tunica vaginalis. His anatomic studies lead him to believe that the true filtration angle is placed more or less behind the base of the iris, and he has, therefore, in 10 cases of glaucoma done an operation in which he opens the retroiridian space. Two were hemorrhagic and 8 absolute in type. The hemorrhagic cases were definitely and permanently improved, while but one of the absolute cases was at all benefited. H. Friedenwald⁴ gives full details of glaucoma occurring in a young woman whose peculiar visual field conforms to that described by Bjerrum in 1890. This peculiarity consists in the direct continuity of the defect with the blind spot. He accepts Bjerrum's hypothesis of "lesion of the nerve-fibers at the margin or in the wall of the excavation." Two mm. test objects are needed for the detection of this defect.

Varieties.—Hemorrhagic: Two cases of glaucoma preceded by retinal hemorrhages are reported by H. F. Hansell,⁵ who remarks that

¹ Ann. d'Oculist., Dec., 1901.

² Ann. of Ophthal., April, 1902.

³ Arch. d'Ophtal., Feb., 1902.

⁴ Ann. of Ophthal., April, 1902.

⁵ Ann. of Ophthal., April, 1902.

the fault cannot be laid at the door of the exuded blood, but must be referred back to the end-arteries or thrombosis and the consequent disturbed circulation within the globe. **Infantile:** G. D. Murray¹ records bilateral hydrophthalmus beginning at 2½ years in a marasmic child that presented the most marked cupping of both nerves. **Simple Non-inflammatory:** C. S. Bull² observes that the symptoms which are supposed to characterize simple chronic glaucoma are not necessarily indicative of the disease, for they are all met with in simple atrophy of the optic nerve. To his mind, the distinguishing feature is increase of tension, for the distinct detection of which repeated examinations are necessary. Early iridectomy while the iris is still mobile, the field but little contracted and the cupping of the disk slight, frequently arrests the disease at least for a prolonged period and preserves the sight remaining at the time of operation. If it lowers the tension, a favorable result is to be expected. If myotics improve the vision and widen the field, it is almost certain that iridectomy will give a favorable result.

Treatment.—Preventive: In discussing the value of iridectomy in glaucoma, Schoen,³ of Leipsic, says: "For the first 12 years of my work in ophthalmology I was a sincere adherent of this theory (the therapeutic value of iridectomy), and applied it repeatedly, giving my patients the assurance that the vision that remained to them would be preserved. But both of Dr. Javal's eyes, which were perfectly iridectomized, became totally blind. This case caused my first serious doubt of the efficacy of the procedure, but it was fully 5 years later before I finally succeeded in ridding myself of my prejudices in favor of the method." Fifteen eyes that had been carefully studied in life showed after death anatomic changes in the ora serrata with degeneration of the ciliary muscle. This latter Schoen views as the heretofore missing factor in explaining glaucoma simplex. He reiterates his statement made in 1884, that 80 % of glaucomatous eyes are either hyperopic or astigmatic; that 13 % show insufficiency of the internal recti, and the remainder are presbyopic. Looking back on the history of 300 cases of glaucoma, he repeats his conviction that every eye can be guarded against glaucoma by attention to the above factors if it can be seen early enough by an ophthalmologist who is accustomed to observe the preliminary symptoms. While recognizing the great value of iridectomy in certain cases of glaucoma, Wicherkiewicz⁴ makes a plea for the wider use of the eserine, pilocarpin, and cocaine combination, claiming that it is efficient in some cases after simple eserine solutions have failed. **Operative:** As the result of an experience with 258 glaucomatous eyes occurring during a 7 years' service in Hirschberg's clinic, F. Mendel⁵ states that to avoid malignant glaucoma Hirschberg operates on but one eye at a time, never on the second eye until the first one is entirely well of the operation. Iridectomy furnished the best results: improvement in 77 % of chronic and 82 % of acute glaucomas. In the majority of cases of simple increased tension it preserves vision,

¹ Ophthal. Rec., Aug., 1902.

² Med. News, Jan., 1902.

³ Ophthal. Rec., Oct., 1902.

⁴ Klin. Monatsb. f. Augenh., July, 1901.

⁵ Berl. klin. Woch., p. 71, 1902.

and improves it in some. Iridectomy is the chief but not exclusive treatment. Of the 258 cases, 9 were successfully treated with eserine only. To guarantee against the depressing and discouraging results of operation in malignant glaucoma, de Wecker¹ never does iridectomy without preceding it with sclerotomy. He believes the curative action of anti-glaucomatous operations depends upon the increased hardness of the eye to be operated on. This action is lessened, and often even *nil*, when there is no abnormal increase in tension and when cicatrization of the pericorneal and scleral wounds takes place under normal conditions of intraocular tension. He believes the therapeutic action of iridectomy can be enhanced by a preliminary sclerotomy. Without insisting upon the benign influence of the latter for facilitating exact iridectomy, de Wecker evidently feels that sclerotomy can replace the second iridectomy which von Graefe made when the first proved insufficient. M. Rohmer² affirms that the superior cervical ganglion controls the vascularization of the posterior segment of the globe, and that the ciliary ganglion controls the anterior segment. He has given the location of the ciliary ganglion close study by investigations on the cadaver. He has removed the ganglion in 6 glaucomatous sightless eyes that on account of the pain would otherwise have gone on to enucleation, and he has been highly gratified at the results. [The operation is a formidable one indeed, as it involves resection of the orbital wall by the method of Kroenlein. Most patients, we imagine, would prefer enucleation.] Rohmer³ recites the histories of 17 cases in which he has done sympathectomy. The best results were obtained in chronic simple glaucoma, five-sixths of this type of cases being improved. Chronic inflammatory glaucoma was bettered in two-thirds of the cases. Five hemorrhagic cases were improved, while the acute and subacute forms were least responsive. G. F. Suker⁴ states that sympathectomy is a justifiable operation, and though not indispensable is a valuable adjunct. Although the excised ganglion shows sclerotic changes, the true relationship between them and glaucoma is an open question. The author feels that iridectomy is still the classic treatment for acute and chronic glaucoma. If sympathectomy is done, it should be only on the affected side, and when an iridectomy or sclerotomy has failed to cure. It is to be preferred in absolute glaucoma and the hemorrhagic form with suitable medicinal treatment after the operation. The excision of this ganglion has varying effects upon the fundus oculi; none detrimental, however. W. B. Marple⁵ brings together the reports in 86 excisions of the superior cervical ganglion, from which he sums up the present status of the operation as follows: (1) The operation is a safe one in the hands of a skilful surgeon; (2) while positive conclusion may not yet be reached, some of the glaucomatous eyes have been improved for some months by the resection; (3) the results are so various that we cannot say just what class of cases it is most applicable to; (4) it does not replace iridectomy, but may possibly supplement it in case the former operation is declined

¹ Abst. Ophthal. Rec., Sept., 1901. ² Ann. d'Oculist., July, 1902.

³ Ann. d'Oculist., May, 1902.

⁴ Jour. Am. Med. Assoc., Dec. 14, 1901.

⁵ Med. Rec., May 10, 1902.

has resulted disastrously to the other eye. [Our own feeling is that this fad has had its day. The point upon which nearly all of its advocates agree is that it does no harm. While even this is not beyond dispute, no one has yet unequivocally taken the position that it does uniform good. Moreover, the prophylactic treatment (*i. e.*, careful measurement of refraction and muscular anomalies) and careful regulation of the daily life are infinitely more important. Finally, massage with skilful drug treatment will control most cases of glaucoma.]

DISEASES OF THE NOSE, THROAT, AND EAR.

By D. BRADEN KYLE, M.D., AND GEORGE FETTEROLF, M.D.,
OF PHILADELPHIA.

DISEASES OF THE NOSE.

Collapse of the Ala Nasi and its Treatment.—Walsham¹ states that this condition is due to a lack of resiliency at the anterior angle of the inferior lateral cartilages of the nose. Temporary relief is obtained by the introduction of a small pledget of cotton-wool into the little depression in front of the vestibule within this angle of the cartilage. To effect a permanent cure a small area on the inner surface of the vestibule is denuded of skin, and the flap thus formed is dissected up as a long strip with its base anterior. It is then rolled into a ball and secured in position in the anterior vestibular pit, which is first made raw, by a suture passed through the septum into the opposite vestibule and tied very lightly so as to avoid strangulation.

Gersuny's Paraffin Prosthesis for Nasal Deformity.—A. C. Heath² reports the case of a man aged 32, who had a defective nose caused by the absence of the entire cartilaginous portion of the septum. Two drams of Schleich's solution was injected in order to prepare a cavity, and on the following day 1½ drams of paraffin was introduced under the skin. A 10 cc. antitoxin syringe with solid plunger and a large aspirating needle was used, the needle being inserted a little below a point midway between the eyebrows and carried subcutaneously just beyond the depression that needed to be filled. On slowly withdrawing the needle, the paraffin at a melting-point of 37° C. was gradually forced out, and to prevent its bulging into the nasal cavity, the operator inserted his little fingers into the nostrils. Twelve hours after the injection there was severe pain and great swelling of the tissues about the nose. Three weeks and a half after the operation the general contour was very much improved, although there remained some redness of the skin over the paraffin, which, however, was gradually disappearing.

The Injection of Paraffin in Rhinoplasty.—Broeckaert³ recommends the method of Eckstein in correcting irregularities in the shape of the nose by means of subcutaneous injections of paraffin. Eckstein uses solid paraffin, which has the advantage of being fusible and of solidifying more quickly than Gersuny's mixture of vaselin and paraffin.

¹ Lancet, Mar. 30, 1901.

² Amer. Med., Dec. 7, 1901.

³ Rev. Hebdomadaire de Laryng., etc., Dec. 7, 1901.

The Air-currents in Nasal Respiration.—Charles A. Parker¹ relates the results of his experiments on the course taken by the air through the nose in inspiration and expiration. Inspiration was studied by filling the air in front of the patient with lycopodium powder and expiration by having the patient smoke cigarettes and gently exhale the smoke through the nose. These experiments were performed in patients with normal nares and in those with various forms of disease, including different forms of nasal obstruction, rhinitis sicca, and adenoids. His conclusions are as follows: (1) That during quiet inspiration in a normal nose the air traverses the middle, superior, and probably the fourth meatus. (2) That inspiration is impeded by: (a) Spurs and deviations of the septum and enlargements of the inferior turbinated body, if they project forward and upward. For practical purposes a rule may be laid down that if such abnormalities cross and break an imaginary line drawn from the anterior extremity of the inferior meatus—i. e., just internal to the vestibule—to the anterior end of the middle turbinate, they will cause obstruction. (b) Enlargements of the middle turbinated body, polyps, etc. (c) Hypertrophies and growths springing from the vault of the nasopharynx. (3) That in expiration the air traverses chiefly the inferior meatus. (4) That expiration will be more especially affected by: (a) Hypertrophies of the posterior end of the inferior turbinal. (b) Hypertrophies, etc., causing stenosis of the inferior meatus.

A Peculiar Effect on the Septal Cartilage noted during Convalescence from Influenza.—L. de Milly² reports a case of a child aged 5 years, in whom, following an attack of influenza, the cartilage of the septum had disappeared, leaving the mucous membrane of both sides intact.

The Correction of Deflections of the Septum.—D. Braden Kyle³ states that the main difficulty experienced in septum operations was the removal of sufficient tissue to prevent backward pressure and consequent recurrence. For a number of years he has removed one or more V-shaped pieces from the septum, and as the result of an experience of 152 cases is convinced that it is one of the simplest and best methods of treating almost all forms of septal deflection. Out of this number there have been only 11 cases in which the operation was not entirely successful, and in these the failure was due more to complications than to the method of operating; in no case was there a perforation. In those forms of deflection which have no concurrent external deformity, and in which the deviation begins at the base, a V-shaped cut should be made on the concave side close to the floor of the nose; sufficient tissue should be removed by this cut, and by other V-shaped incisions on the convex side, to allow of the septum swinging freely from the top and to permit it to assume the perpendicular position without crowding. The resiliency of the septum should be destroyed by the removal of one or more V-shaped pieces and simple

¹ Jour. of Laryngol., Rhinol., and Otol., July, 1901.

² Rev. Hebd. de Laryng., etc., Oct. 12, 1901.

³ Amer. Med., May 31, 1902.

saw incisions, taking care to avoid destroying the blood-supply of any portion of the septum by too close parallel cuts on the same side of the septum. It is not necessary in all cases to dissect up the mucous membrane as preliminary to making the V-cuts, and where a number are required it would be impossible. Should the mucous membrane



Fig. 85.

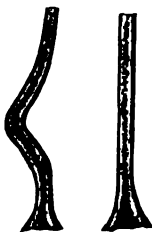


Fig. 86. Fig. 87.

The V-shaped cuts are diagrammatic only. The position and direction of cut will vary in different cases. The dotted line indicates where the cut should be made on opposite side (Kyle, in Amer. Med., May 31, 1902).



Fig. 88.

Fig. 89.

Fig. 89 should show the V-shaped cut extending down on the septum (Kyle, in Amer. Med., May 31, 1902).

flap be made, as is usually required when a large piece of cartilage is to be removed at the base, it is not necessary to suture it in place, for if it is properly replaced the metal tube will give it sufficient support. In those deformities in which the nose is flattened and it is found desirable to elevate it, no V-shaped strip should be removed, but a beveled edge, cut somewhat similar to the method used in lengthening shortened tendons, should be used. These strips can be removed by either

Kyle's small curved saw or Fetterolf's saw-file, which can be made of any angle, so that a piece of either wide or narrow angle can be removed. It is rarely necessary to make more than two V-shaped cuts, as the destruction of the resiliency of the septum can be completed by means of saw-cuts which will allow of its being easily molded into shape. The advantage of the saw-cut in controlling the line of fractures when the bony septum is involved is great, while the especial advantage of the saw-file is that it renders easy the removal of the V-shaped strip from the body septum. If the V-shaped grooves and saw-cuts have been properly made and placed, there will be little need for the use of septum forceps to destroy resiliency. Should, however, any force be required, the small septal forceps of Roe or the Kyle roll forceps can be used for the purpose. Should the occluded nostril be so narrow as to make the insertion of cutting instruments difficult, the Sinexon dilator can be used to widen the nasal chamber sufficiently to allow the introduction of the necessary instruments. The operation is completed by the insertion of a malleable metal tube, which acts as a splint, affording support and making no pressure. Should there be swelling after the operation, the lumen of the tube can be readily decreased by compressing it with a pair of forceps. Another advantage is that the malleable tube can be so molded as to fit any nostril, either at the time of operation or afterward, and in case the edge is found to be cutting into the soft parts the tube can be removed and the offending portion trimmed off with an ordinary penknife. The tube *per se* is nonirritating, in one case remaining in the nostril 6 weeks with absolutely no bad results. Should there be external deformity along with the septal deflection, it can be readily corrected by the following procedure: A small oblique incision (see Fig. 88) is made through the skin into the nasal cavity on the convex side of the deflection just at the point of junction of the cartilage and bone, through which the small saw or saw-file is inserted and a V-shaped portion of the cartilage removed. This should extend down on the septum (further than is shown in Fig. 89) a sufficient distance to break up all resiliency, and the amount removed should be sufficient to render the cartilaginous portion of the nose entirely pliable. The external wound is then closed by one suture, as it is not necessary to make an incision over $\frac{1}{8}$ to $\frac{1}{4}$ inch in length. It is then sealed with collodion over cotton.

The Correction of Deformities of the Nasal Septum.—George Fetterolf¹ states that the pathology of septal deformities rests upon the fact that there is always present redundant tissue, signifying by that term more tissue than is necessary to afford a septum running in a straight line from margin to margin. On this basis septal malformations are classified as follows: (1) Deviation without thickening; (2) deviation with thickening; (3) thickening without deviation. There is usually but slight difficulty experienced in correcting those cases embracing the third class, and it is on account of the failure to remove tissue excess in repairing those of the other classes that so many unsatisfactory results

¹ The Laryngoscope, Aug., 1902.

have been obtained. The method of correction described is that of the Kyle V-shaped operation, in which the use of the Fetterolf saw-file (Fig. 90) is illustrated. The instrument may be called a saw-file, as it comprises the elements of both a saw and a file. The edge is curved, and consists of a series of teeth, half of which cut when the instrument is pushed, and the other half when it is pulled. These teeth are prolonged up the sides, which are curved on the flat, and which consist really of a series of planes, the distal half cutting when the instrument is pushed, and the proximal half when it is pulled, similarly to the edge. The back is smooth and flat, with rounded edges. As the amount of tissue requiring removal varies in different cases, the instrument is made in three sizes, the cutting sides meeting at an angle of 40, 55, and 70 degrees, respectively. In the first two the distance between the back and the tip of the most prominent tooth is 5 mm. The one of widest angle is required where the deviation is greatest, and to facilitate its introduction into the narrowed nostril, the distance between the back and the most prominent tooth is reduced to 3 mm. The advantages appertaining to the use of the saw-file are: (1) No preliminary dissection of the mucous membrane is

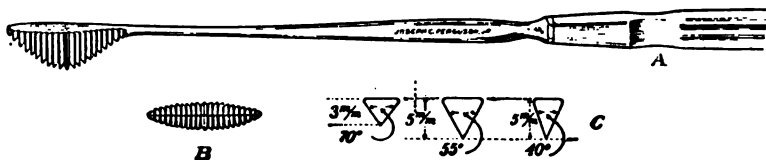


Fig. 90.—Fetterolf's saw-file: *A* represents a side view of the instrument as it lies on the wall; *B* is a face view, or, architecturally speaking, a plan of the cutting part, and shows very clearly the arrangement of the teeth; *C* is an elevation or cross-section of the three different sizes, showing the angles at which the faces meet and the distance from the most prominent tooth to the back.

required; (2) a properly shaped strip of tissue is removed; (3) the strip is quickly removed, so that prolonged anesthesia is not required; (4) the margins of the cut are exactly parallel, and thus accurate coaptation and quick union are promoted; (5) the bony septum can be attacked as satisfactorily as the cartilaginous.

Suprarenal Gland for Hemorrhage.—George Fetterolf¹ suggests as a result of certain reported untoward events following the use of suprarenal preparations that this powerful vasoconstrictor be used only under the following circumstances: (1) When the site of operation can be immediately packed, (2) when it is advisable to conserve as much blood as possible even at the risk of secondary hemorrhage, (3) when the presence of the blood obscures the field of operation and prevents accuracy, (4) when it is necessary to open the mouths of some of the accessory sinuses, or (5) when the tissues need to be shrunk to afford additional room for manipulation.

Suprarenal Gland for Relief of Pain.—An editorial in the "Therapeutic Gazette," July 15, 1901, quotes instances in which pain has been relieved by the local use of suprarenal gland. The cases men-

¹ Amer. Med., May 3, 1902.

tioned include congestions of the eye, nose, and throat, recurrent cancer of the breast, stricture of the esophagus, laryngeal tuberculosis, and periodontitis. [The relief afforded was doubtless due to the diminution of congestion and not to any benumbing effect on the sensory terminals.]

Ethyl Chlorid as a General Anesthetic in Nasal Surgery.—John Mackie¹ states that he has administered ethyl chlorid 48 times, 27 of which were in operations on the turbinals and sinuses, 4 on adenoids, and 2 on septal deformities. It was administered 15 times for dentists and general surgeons. In no case was there the slightest cause for anxiety. The method of administration used is to exclude all air and give the drug rapidly and continuously, sending the spray right into the gauze in the ball of the inhaler. For a short operation a half to three-fourths of a minute of rapid administration was sufficient, and produced an anesthesia lasting from 2 to 3 minutes. On account of the local action of the ethyl chlorid ischemia of the nasal passages is produced and the operation is practically bloodless. This condition rapidly passes away, and unless the nostrils be plugged a violent secondary hemorrhage may arise.

Ethyl Chlorid Narcosis.—W. J. McCardie² reports the results of the use of ethyl chlorid. One case died; in a second a rash developed during the anesthesia; and in a third the muscular excitement prevented full anesthesia and operation. The longest anesthesia lasted about 17 minutes and was very satisfactory, although the same patient had developed serious symptoms under the administration of chloroform. He found ethyl chlorid preferable to nitrous oxid because the anesthesia lasted longer, usually from three-fourths of a minute to 2 minutes, and caused no congestion. He uses between 5 cc. and 10 cc., and if desirable the patient can remain in the upright position. It is particularly satisfactory in adenectomy, tonsillectomy, and other operations of short duration around the nose and throat. McCardie states that if the patient is very strong and excitable or an alcoholic it is advisable to have at hand ether and chloroform in case the excitement induced by the ethyl chlorid render its continuance impossible. He administers the drug gradually so as to prevent struggling, and states that in his cases the after-effects have been either very slight or *nil*.

Ozena.—Ernest Barth³ states that while no single theory explains the presence of atrophic rhinitis, the alteration in the nasal secretion is the most important factor. He recommends the use of the Gottstein tampon, medicated or nonmedicated, and allowed to remain in position for 24 hours. The solutions suggested are sodium bicarbonate, boiled normal saline, and potassium permanganate in weak strength. For the purpose of cleansing he uses a solution composed of borax 1, glycerin 3, and distilled water 17 parts. With the persistent use of these he claims that the disease process can be checked, and that regeneration of the mucous membrane can be promoted by massage. He quotes Dreyfus to the effect that soda sulfate of phenol diluted with 2 or 3

¹ Jour. of Laryngol., Rhinol., and Otol., Oct., 1901.

² Lancet, July 20, 1901.

³ Fortschritte der Med., No. 33, Nov. 22, 1901.

parts of water and applied directly to the mucous membrane entirely removes the odor. Vonnet¹ recommends irrigations of methylene-blue in the strength of 2.5 : 1000 in the treatment of ozena. The odor is decreased at once, and after 3 or 4 treatments he has been able to obtain recovery. If the condition is of syphilitic origin, appropriate specific medication is used, and aids the local action of the methylene-blue.

Atrophic Rhinitis; New Treatment by Paraffin.—R. Lake² has reported the case of a woman, aged 25, who had suffered from atrophic rhinitis for many years. The crust-formation had been corrected, but the patient expressed dissatisfaction because she could not feel the passage of air through her nose. Lake therefore attempted to narrow the nasal passages by making artificial inferior turbinals by means of submucous injections of paraffin. The paraffin was injected in 5-minim quantities at intervals of a week. The relief experienced by the patient was great, and the turbinals were restored to their natural color.

Rhinitis Caseosa.—De Rosa Michele³ describes 3 cases of this disease, in one of which the center of the mass was occupied by a large rhinolith, while in the other two there was associated a maxillary empyema. Cozzolino suggests the possibility of two forms of the disease, the true and the false, and is supported in this view by Guarnaccia, who describes *Streptothrix alba* as the specific microorganism of the true form, while it is absent in the others. Michele has collected 49 cases, classed as follows: True caseous rhinitis, 9; false caseous rhinitis, 40. The latter are divided etiologically as follows: Sinusitis or rhinitis purulenta 14; rhinoliths, polyps, and other tumors, 14; cause not stated, 12. The 9 true cases were those in which there was no definite etiologic history, and were therefore believed to depend on the two essential factors, the scrofulous diathesis and the specific microbe. It is believed by many, in view of the great frequency of the scrofulous diathesis and the comparative rarity of caseous rhinitis, and the fact that it is practically always unilateral and is rapidly cured, that scrofula is not an important causative factor. Michele believes that the essential factors in the disease are a purulent secretion and an obstacle to its elimination, and concludes: (1) The small number of cases of rhinitis caseosa vera, with some exceptions, present the clinical features necessary for the disease according to the common theory. The rare exceptions leave room to doubt that the observations have been exact. (2) The rarity of the affection, the rapidity of the cure, and absence of recurrence exclude scrofula as a cause. (3) The disease cannot be regarded as microbic, because no specific microbe has been found. Michele excludes *Streptothrix alba* Guarnaccia, on account of its being found in a case of the so-called false disease; and even had it been found in one of the true, it would not have been conclusive, as it so closely resembles the filamentous forms seen in pseudorhinitis. The disease has

¹ Bull. de l'Acad. de Méd., Oct. 8, 1901.

² Jour. of Laryngol., Rhinol., and Otol., May, 1902.

³ Archiv. Ital. de Otol., Torino, April to June, 1901.

never been produced in man or animal by inoculation of *Streptothrix alba*.

Rhinorrhea.—Natier,¹ of Paris, holds that rhinorrhea is invariably indicative of a general neurasthenic condition, and is found only in that disease. He regards the nasal lesions found in connection with rhinorrhea—*e. g.*, turbinal enlargements and polypoid degeneration of the mucosa—as caused by rather than causing the watery discharge. The hypersecretion, in his judgment, is due to hyperexcitation of the glands, which in its turn is consequent upon the underlying nervous disorder. He also ascribes considerable etiologic importance to the mucosa of the frontal sinus, thereby accounting for the almost constant frontal headache. The chemical constitution of the fluid is thoroughly gone into and compared with the results of the analysis of the fluid found in cases of so-called “cerebrospinal rhinorrhea.” He does not believe that the discharge is cerebrospinal fluid, because analysis has failed to show any differences between the fluids secured from the two classes of cases. Treatment is directed toward the correcting of the nervous disorder, and local treatment is only palliative and really unnecessary, since appropriate general treatment will cause a disappearance of the local lesions. Briefly summarized, Natier’s treatment is as follows: “A strict milk diet. The patient begins by taking 3 liters of milk a day and increases to 5. To overcome constipation, a dose of purgative water every morning. Fifteen hours’ repose in the reclining posture is ordained. A cold bath every day, with brisk rubbing of the skin. The patient is made to avoid all fatigue, physical, mental, or moral. This method has given the author excellent results in his cases.” [Frequently the underlying cause in this condition is an altered chemistry of the gland secretion of the body; attention to the correction of this faulty chemistry will often relieve the “general neurasthenia.”]

Nasal Hydrorrhea.—Augieras² reports a case of nasal hydrorrhea of very unusual and peculiar origin. The patient had been operated on for empyema of the maxillary sinus, and a postoperative salivary fistula had been left which discharged into the sinus. Cauterization of the borders of the sinus resulted in the cure of the rhinorrhea.

Trichloroacetic Acid in Hay-fever.—H. Krause³ recommends that a 1 % solution of this drug be snuffed as a cure for hay-fever. He claims that in 30 cases improvement and cure have resulted in from 2 to 8 days.

The Treatment of Hay-fever.—Robertson,⁴ of Cincinnati, deprecates the use of the spray on account of its failure to reach the finer recesses of the nose, and recommends for this purpose the use of the nebulizer. As a preliminary cleansing step he advises spraying with one of the following solutions:

Zinc sulfate	0.6 (gr. x)
Distilled water	120.0 (f3iv)

Use as a spray in the ordinary cases having a watery discharge.

¹ La Parole, abstracted in New Orleans M. and S. Jour., Aug., 1901.

² Rev. Hebdomadaire de Laryng., etc., June 29, 1901.

³ Jour. Am. Med. Assoc., Aug. 31, 1901. ⁴ Jour. Am. Med. Assoc., July 27, 1901.

When the discharge is profuse, with pain and tenderness, use the following:

Morphin sulfate	0.12 (gr. ij)
Atropin sulfate	0.09 (gr. ias)
Zinc sulfate	1.0 (gr. xvj)
Camphor water sufficient to make	120.0 (f 3 iv)

Use as a spray.

After using the spray apply the following in the form of a vapor in the nebulizer to reduce the turgescence and to give temporary relief:

Cocain	0.50 (gr. viij)
Menthol,	
Camphor, of each	1.25 (gr. xxx)
Oil of cloves	0.75 (mxxij)
Liq. albolenc.	60.0 (f 3 ij)

Use in the form of a nebula.

For permanent but less immediate effects he advises one of the following, administered by means of the nebulizer or comminuter:

Zinc sulfate	2.0 (gr. xxx)
Creosote (beechwood)	2.0 (f 3 ss)
Glycerin	30.0 (f 3 j)
Distilled water enough to make	90.0 (f 3 iij)

Or:

Quinin hydrobromate	2.0 (3 ss)
Iodin (crystals)	0.6 (gr. x)
Carbolic acid	2.0 (3 ss)
Alcohol	16.0 (f 3 iv)
Glycerin enough to make	60.0 (f 3 ij)

Or:

Aspidospermin	1.0 (gr. xv)
Alcohol,	
Water, of each	16.0 (f 3 iv)

Use in nebulizer.

[Aspidospermin is a respiratory stimulant and antispasmodic. It can be given internally in doses of 1 to 2 grains.] Or:

Tannic acid	2.0 (3 ss)
Glycerin	30.0 (f 3 j)
Distilled water enough to make	60.0 (f 3 ij)

Or:

Salol,	
Chloral hydrate,	
Camphor, of each	1.0 (gr. xv)
Oil of cloves	0.6 (mxx)
Hydrocarbol enough to make	60.0 (f 3 ij)

To be used in the form of a nebula.

Coakley recommends the following to render the mucous membrane less sensitive to irritants:

Menthol	2.6 (gr. xl)
Camphor	1.3 (gr. xx)
Eucalyptol	4.0 (f 3 j)
Oil of pini pumilionis	2.0 (mxxx)
Benzoinol, enough to make	60.0 (f 3 ij)

Use in oil atomizer, every 2 hours, if necessary.

For 6 weeks prior to the expected attack he recommends the following:

Potassium iodid.....	16.0 (℥iv)
Fluid ext. of <i>grindelia robusta</i>	24.0 (f℥vi)
Simple elixir,	
Rectified spirit, of each to make	120.0 (f℥iv)
One teaspoonful well diluted in water, 3 times daily.	

The following is recommended by the "Journal des Praticiens" as a local application:

Acetic acid	0.25 (miv)
Resorcin	0.18 (gr. ii)
Sodium chlorid	0.5 (gr. viii)
Water	60.0 (f℥ij)

The following combination is of service to relieve the attacks:

Heroin	0.06 (gr. j)
Atropin sulfate	0.0025 (gr. x)
Caffein citrate	1.0 (gr. xv)
Salophen	5.0 (gr. lxxv)
Make into 15 capsules and give 1 capsule every 3 hours.	

[In a majority of cases the patient's symptoms are aggravated by local treatment; more attention should be given to external medicines and less local.]

Vasomotor Rhinitis.—W. Lubinski¹ recommends the injection of 6 to 10 drops of 10 % zinc chlorid solution beneath the mucous membrane to reduce the turbinal enlargement. The mucous membrane is first anesthetized and a syringe with a cannula twice the usual length is introduced beneath the mucous membrane. It is then slowly withdrawn and the solution forced out drop by drop. A pledget of cotton saturated in a 10 % antipyrin solution is then applied to the puncture as a hemostatic. He claims that these injections are less painful and more easily executed than cauterization and give rise to less after-disturbance. [To this procedure a possible objection, originally suggested by Scheppegegrell, is the formation and subsequent migration into the general venous circulation of small thrombi.]

The Etiology of Malignant Tumors.—Ziem² mentions the following as some of the predisposing causes of malignant tumors: Chronic catarrh, and sometimes an acute attack; probably always necessary is an infectious irritant, such as chronic suppuration, influenza, syphilis, or erysipelas; suppuration of the nose and ear frequently precede malignant disease, as do infections; on account of the increased frequency or prevalence in marshy districts some miasmatic element is probably one of the causative elements.

Sarcoma of the Nasal Septum.—H. H. Craig³ reports a sarcoma the size of a walnut located on the upper anterior portion of the cartilaginous septum in a young man of 21. The patient during a period of one month had lost 18 pounds in weight and had suffered with frequent and severe attacks of epistaxis. The growth was removed with the cold snare and the base cauterized with the galvanocautery. The

¹ Berl. klin. Woch., Dec. 30, 1901.

² Monats. f. Ohrenheilk., Mar., 1900.

³ Montreal Med. Jour., June, 1901.

pathologic report stated that the "specimen gave the impression of a myxoma with some dilation of the lymphatics and showing a distinct tendency to sarcomatous degeneration."

Nasal Sarcoma.—Dunbar Roy¹ reports a case in which tying of the external carotids was tried. The effect was slight, the patient dying 7 months after the first appearance of symptoms.

Rodent Ulcer of the Nose.—A. E. Garrow² reports a case of a woman of 71, in whom 22 years previously 3 small nodules had developed on the inner canthus of the right eye; these ulcerated and were followed by a similar condition on the other side. The sore covered the whole right side of the nose and part of the left. At no time was the bone involved. The entire ulcer, including the base and a quarter inch margin of healthy tissue, was removed by the scalpel and compression applied. Nougard's paste was applied for 28 hours. A slough then came away, healthy granulation tissue appeared, and a sound skin formed over the whole area.

Hypertrophy of the Anterior Lip of the Hiatus Semilunaris.—Dundas Grant³ states that this ridge is sometimes the seat of considerable hyperplasia, frequently coming in contact with the middle turbinal and thereby converting the normal groove into a tube leading from the ostium maxillare to the infundibulum. The enlargement is some times so extreme as to simulate an extra turbinal, or may even overgrow and conceal the middle turbinal. The latter condition is to be determined by the impossibility of passing a probe between the swelling and the lateral nasal wall. Its removal is best effected by transfixing it at its middle with the point of one blade of a pair of scissors and cutting through it. The halves can then be readily removed separately by means of the snare.

The Middle Turbinate Body and its Relation to Chronic Nasal Diseases.—L. H. Baker⁴ gives the following indications for removal of the middle turbinal: Repeated recurrence of nasal polyps, sinus occlusion, fetid crusting of the discharges on the upper portions of the nasal chambers in nonspecific cases, reflex conditions due to contact of the septum, and vasomotor rhinitis.

A Family Form of Recurring Epistaxis, Associated with Multiple Telangiectases of the Skin and Mucous Membrane.—Osler⁵ reports 3 cases. Two were members of a family in which 7 suffered from epistaxis. Both of them had had nosebleed from childhood and presented numerous punctiform angiomas on the skin of the face and of the mucous membrane of the nose, lips, cheeks, and tongue. The third patient had suffered to an unusual degree from recurring epistaxis, and the telangiectases were most abundantly distributed over the skin of the body and the mucous membrane. The condition was entirely distinct from hemophilia.

¹ Jour. Am. Med. Assoc., Aug. 10, 1901. ² Montreal Med. Jour., Jan., 1901.

³ Jour. of Laryngol., Rhinol., and Otol., Oct., 1901.

⁴ Jour. Am. Med. Assoc., July 20, 1901.

⁵ Johns Hopkins Hosp. Bull., Nov., 1901.

Nasal Neuralgia from a Galvanocautery Cicatrix of the Inferior Turbinal.—Lermoyez¹ reports a case of a girl of 19 who complained of marked nasal obstruction, pharyngeal irritation, and frontal headache, with the history of the removal of nasal polyps 2 years previously. Examination revealed a diffuse hypertrophic rhinitis with myxomatous degeneration of the inferior turbinal. The redundant tissue was removed as far as possible with the cold snare, complete removal being accomplished by several applications of the galvanocautery. Three months later the patient returned with free nasal respiration but complaining of severe supraorbital neuralgia. Antipyrin was prescribed, but for 3 months the pain continued to be of such severity as to prevent work. On examination a painful spot was found at the point of emergence of the nasal nerve and a hyperesthetic zone at the plane of the cautery scar on the inferior turbinal. The region embracing the scar was removed by turbinectomy, with the result of complete cessation of the neuralgia. Microscopic examination of the removed tissue revealed the presence of a nerve-fiber engaged in the galvanocautery scar. [The nerve-fiber was probably one of the filaments of the external branch of the nasal nerve and the reflex path back through the ophthalmic nerve to the Gasserian ganglion, and then out again through the ophthalmic and frontal nerve to the supraorbital branch of the latter.]

An Unexpected Discovery in the Nerves of the Nasal Mucous Membrane in Nasal Reflex Neuroses.—Lewy² reports finding in two cases of marked nasal reflex neuroses due to hypertrophy of the inferior turbinal, an unusual number of thickened nerve-filaments ramifying under the free surface of the removed hypertrophied tissue. He attributes the increased amount of nervous irritability to this augmentation rather than the changes in nerves already preexisting.

Vertigo and Epilepsy of Nasal Origin.—Collet³ and Jousset⁴ report 3 interesting cases. Collet's case was that of a man aged 32, whose attacks began with a pricking sensation in the nose which caused violent sneezing. This was soon followed by severe pain in the nuchal region, on the appearance of which equilibrium was suddenly lost and he fell forward on his face. There was no loss of consciousness. This was followed by general physical and mental depression. A few days later the attack was repeated and was accompanied by twitchings of the forearm and fingers. Examination of the nose showed the presence of a septal spur on the left side impinging on the outer wall and associated with an area of hyperesthesia. Collet ascribes the cause of the seizures to the nasal condition. Jousset reports 2 cases with distinct epileptic symptoms. One was a man of 26, who complained of impaired nasal respiration with occasional pricking in the nose, followed by mild epileptic attacks with loss of consciousness for a few seconds. After the attack there was a well-marked period of depression. On

¹ Arch. Internat. de Laryngol., etc., July-Aug., 1901.

² Arch. f. Laryngol. u. Rhinol., Bd. xii, Heft 1.

³ Ann. des Mal. de l'Oreille, du Larynx, etc., Feb., 1902.

⁴ Rev. Hebd. de Laryng., etc., Mar. 15, 1902.

examination of the nose a marked deviation of the septum was found, correction of which greatly diminished the frequency and severity of the attacks. The other case was a woman of 30, who for a long time had suffered from occasional epileptic attacks and in whom was discovered a unilateral hypertrophic rhinitis. Reduction of the enlarged turbinates by means of the galvanocautery and the use of the nasal douche completely relieved the epilepsy.

The Treatment of Certain Nasal Affections by Hot Air.—Lichtwitz,¹ of Bordeaux, employs sittings of 3 minutes each and administers a current of hot dry air at a temperature of 160° to 195° F. to the nasal chambers. The necessary apparatus comprises a generator of hot air, a reservoir, a conducting tube, and a cannula. The classes of cases suitable for this treatment are: (1) affections classified under the term "spasmodic rhinitis" (hay-fever, asthma, spasmodic sneezing, etc.); (2) acute and subacute rhinitis, with implication of sinuses; (3) hypertrophic rhinitis with varying degree of obstruction.

Foreign Bodies in the Nose.—An editorial in the "Clinical Review," November, 1901, recommends the following procedures in the removal of such objects: Cocainization of the mucous membrane, followed by compression of the free nostril and a strong and quick blowing of the nose. Should this fail, a posterior nasal douche is suggested. [This procedure cannot be condemned too strongly, on account of the well-recognized possibility of damage to the eustachian tube and middle ear.] If instrumental means becomes necessary, a short, sharp hook or a thin spoon with a sharp curve may be gradually worked to one side of and behind the body and its withdrawal thus effected. [Sometimes, especially in children, general anesthesia will be required both on account of the restlessness of the patient and the pain produced by the necessary manipulation.] The foreign body can sometimes be pushed into the nasopharynx; and if this fail and anterior extraction be found impossible, it may then become necessary to crush the substance and remove it piecemeal.

A Self-looping Nasal Polypus Snare.—Atwood Thorne² showed this instrument (Fig. 91) before the Laryngological Society of London. It consists of a Y-shaped end-piece which is joined on to the ordinary Krause snare. The ends of the Y are connected by a slightly curved surface, between which and the wire the polypus is caught. When the polypus is withdrawn from the nose, simply separating the finger-plates of the snare will re-form the loop without the adjustment with the fingers that is usually required. There being no knot or sharp bend in the wire, the common tendency of the latter to break is absent. The instrument can also be used for the removal of posterior hypertrophies of the inferior turbinal, as it can be passed through the nose with the loop retracted; when the right position has been attained, the loop can be ejected, and it will then take on the curve to which it has been previously bent. It can also be used in the larynx.

¹ Ann. des Mal. de l'Oreilles, April, 1901.

² Jour. of Laryngol., Rhinol., and Otol., Mar., 1902.

A Nasal Saw.—P. G. Goldsmith¹ describes a nasal saw (Fig. 92) that will not slip, jam, or bend. The blade is triangular on section with the base toward the septum, and the edge therefore beveled. It is made in

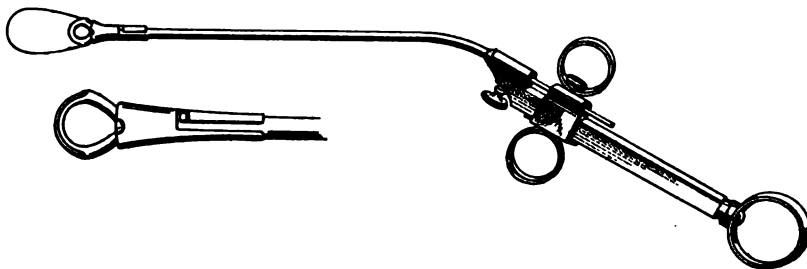


Fig. 91.—Thorne's self-looping nasal polypus snare (*Jour. of Laryngol., Rhinol., and Otol.*, March, 1902).

rights and lefts, and the one used in cutting upward on the right side is used in cutting downward on the left. A specially devised handle accompanies the saw blades.

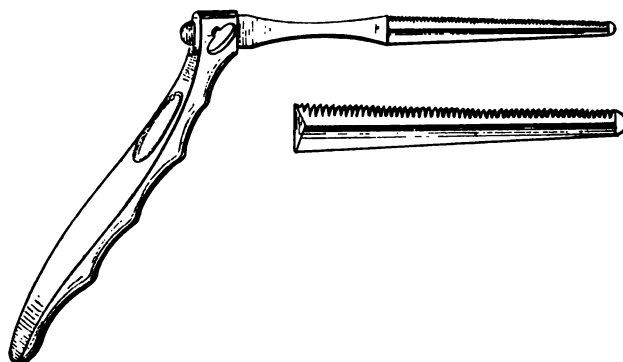


Fig. 92.—Goldsmith's nasal saw (*Brit. Med. Jour.*, July 23, 1901).

DISEASES OF THE ACCESSORY CAVITIES.

Empyema of the Frontal Sinus.—E. Fletcher Ingals,² in a comprehensive article, reviews the development, normal and anomalous anatomy, and communications of the frontal sinus. Among other conditions mentioned, which predispose to inflammation of the sinus, and render difficult catheterization of the infundibulum, is a hyperplastic condition of the uncinatè process. Etiology, symptomatology, diagnosis, and prognosis are thoroughly discussed and a comprehensive line of treatment is laid down. In acute cases the ordinary soothing and nasal treatment, along with the use of adrenal gland or its alkaloids and cocain, is recommended. In latent chronic cases, cleansing and antiseptic measures are of palliative value, but usually frequent washing

¹ *Brit. Med. Jour.*, July 23, 1901.

² *Jour. Am. Med. Assoc.*, July 27, 1901.

out and disinfecting of the sinus will be found necessary, and in order to do this satisfactorily a preliminary removal of the anterior portion of the middle turbinal is required. Ingals recommends especially a 3 % to 8 % solution of protargol. In order to establish free drainage it is sometimes necessary to open the sinus through the nose with a Palmer drill or a Krause antrum trocar. This procedure is rendered comparatively easy by the fact that long retention of pus has distended the sinus and afforded a larger point of attack. Krause's trocar is perhaps preferable, because through it a drainage-tube can be introduced. The best method of operating is to make an external opening into the sinus and then establish free communication with the nose by breaking down the floor of the sinus through the external opening. This method should always be adopted in those more violent types in which there are marked orbital or cerebral symptoms. The incision, after a preliminary shaving off of the eyebrow, should be made through this region down to the bone. The bony wall of the sinus should then be removed by a trephine, chisel, or saw. Ingals favors Tilley's simple vertical incision, which is made in the middle line and extends upward for 2 inches from the root of the nose. Collier removes with the trephine a button of bone in the median line, thus exposing both sinuses and determining whether only one or both are involved in the disease. To avoid the deformity due to the sinking-in of the soft tissues after the removal of the bone, German operators open the sinus by making an osteoplastic flap which includes the rim of the orbit. If a very radical operation is indicated, both the anterior and lower walls can be removed, leaving a bridge of bone at the orbital margin. After the sinus has been opened, free nasal drainage can be established by means of a Krause bent trocar, which is passed from above downward with a finger in the nostril to act as a guide. The opening should be of sufficient size to allow of the introduction of a funnel-shaped drainage-tube. The tube employed by Ingals is a modification of that of Luc, and has a flange on the lower end to keep it from creeping up into the sinus. The external opening should be maintained in the majority of cases until the cessation of suppuration, and it is sometimes necessary, in order to insure free drainage and a radical cure, that the ethmoidal cells be thoroughly broken down. To maintain a free opening into the nose it is sometimes advisable, after the anterior wall of the sinus has been opened, to perform temporary osteoplastic resection of the nasal bone and the nasal process of the superior maxillary. The after-treatment consists in frequent irrigation with a warm boric acid solution followed by a 5 % solution of protargol, or a stronger solution in case it can be borne by the patient.

Mucocele of the Right Ethmoid.—Mann¹ gives the history of a patient, aged 39, who in his youth had had an injury of his head and at the age of 19 had acquired syphilis. For 2 years there had been protrusion of the right eye along with impaired vision. At first the eyeground was normal, but later choked disc developed. The eye was

¹ Münch. med. Woch., No. 28. 1901.

displaced outward as well as forward, and at the inner canthus was an elastic swelling the size of a cherry. The lower boundary of the ethmoidal cells bulged inward and downward. This swelling was perforated with a probe and the cells opened up with Hartmann's forceps. The evacuated fluid was of syrupy consistency, chocolate color, sterile and contained considerable cholesterin. The sac did not refill and the eyeball resumed its normal position after the operation, but for a few days showed a tendency to advance when the nose was blown. The choked disc disappeared and vision returned to normal. Mann believes the cyst to have been congenital, and states that only 8 similar cases have been reported.

The Treatment of Suppuration of the Antrum through the Natural Opening.—Norval H. Pierce¹ states that the ostium maxillare varies in size from 3 mm. to 19 mm., and likewise in form, in some instances being elliptic and in others reniform. He also states that this opening can be readily reached and entered by a properly bent probe passed through the middle meatus, especially if the soft parts have been previously shrunk with cocain and suprarenal gland. Should there be present tumors, hyperplastic tissue, or marked septal deviation, the procedure is rendered correspondingly difficult or even impossible. The introduction may be accomplished without the aid of vision with as much ease as ordinarily attends the passing of the eustachian catheter, and is rendered still more easy by the aid of illumination and direct inspection. The solutions recommended are Thiersch's solution of soda bicarbonate, 2.5 % carbolic acid, saturated solution of boric acid and acetotartrate of aluminum, 1 ounce of the saturated aqueous solution to 2 quarts of sterilized water. An attempt should always be made to treat the diseased sinus through the natural opening before making an artificial puncture.

Syphilitic Hydrorrhea of the Maxillary Sinuses.—Augieras² reports a case of a woman of 23 who exhibited the signs of congenital syphilis and suffered from hydrorrhea of the maxillary sinus. The condition arose at the same time that the maxilla became the seat of an attack of specific osteoperiostitis; antisiphilitic treatment caused relief of the osseous condition and also a cessation of the watery accumulation in the sinus.

Serous Disease of the Maxillary Sinus.—W. E. Casselberry³ states that the frequency of this disease has been disclosed of late mainly by the more general exploratory puncture of the antrum in the search for empyema. It is one of the methods of termination of acute sinusitis and consists really in chronic catarrhal inflammation with retention of mucoserum. Formerly only large accumulations of fluid, but latterly small accumulations of mucoserum and serum, have been found to be of relatively frequent occurrence. Some observers believe the condition to be one of free fluid in the antrum, while others hold that the condition is always cystic. Casselberry relates the history of 2 cases which support

¹ Laryngoscope, Sept., 1901.

² Rev. Hebdomadaire de Laryngologie, etc., June 29, 1901.

³ Jour. of Laryngology, Rhinology, and Otology, Sept., 1901.

the former view. The fluid withdrawn showed the presence of serum albumin, a trace of mucin, and the following microbes: *Bacillus coli communis*, *Micrococcus cereus albus*, *Bacillus subtilis*, Friedländer's pneumococcus, and a small undetermined bacillus. The treatment recommended is the correction of any nasal disease, the removal of obstruction to the ostium maxillare, and, if the condition is cystic, opening the anterior wall of the antrum and curetting.

Empyema of the Right Maxillary, Ethmoidal, and Sphenoidal Sinuses, with Sudden Blindness of the Left Eye.—T. H. Halsted¹ reports the history of a young woman of 21, with an offensive, purulent discharge from the right nostril, who became suddenly blind in the left eye. The left pupil was dilated, but contracted when a light was held before the right eye, which was unaffected. Examination of the nose revealed the presence of pus in the middle meatus. Transillumination showed the right maxillary sinus to be entirely opaque. The sudden blindness was attributed to involvement of the ethmoidal and sphenoidal sinuses and the breaking-down of the septum between the two sphenoidals, thus allowing the pus to get into the left side and press on the optic nerve. The anterior portion of the right middle turbinal was removed and the posterior ethmoidal and sphenoidal cells opened by means of the curet. Hemorrhage necessitated a suspension of the operation at this point, but some relief was obtained. Later the posterior part of the middle turbinal was removed and the opening into the sphenoidal sinus enlarged. The latter was washed out and a decided degree of improvement of vision resulted.

Sphenoidal Sinusitis.—Gaudier and Heze² report the history of a man aged 45 who suffered with severe headache which came on every night about the same time and then gradually disappeared after a little white discharge had been blown from the nostril of the painful side. A ridge on the septum, the posterior half of the middle turbinal, and the anterior end of the inferior turbinal were removed, after which the anterior wall of the right sphenoidal sinus was removed with a Martin's forceps. The sinus was curetted and swabbed with chlorid of zinc, and, after some loose pieces of mucous membrane had been removed with the galvanocautery, packed with iodoform gauze. The packing was first removed daily, then every second day, until finally a complete cure resulted. When the nostrils are narrow and the turbinals large, the writers recommend the removal of the posterior half of the middle turbinal, and state that operation through the frontal sinus or maxillary antrum is unjustifiable except in cases of multiple sinusitis.

Spraying and Insufflating the Accessory Nasal Cavities.—S. S. Bishop³ describes a combination of cannula and spray-tip (Fig. 93) which can be used for this purpose. It is practically a modification of the eustachian catheter, but so constructed that it can be introduced into a very narrow space. With it the antrum can be sprayed

¹ Archives of Otology, vol. xxx, No. 3.

² L'Echo Med. du Nord, May 26, 1901.

³ Jour. Am. Med. Assoc., July 13, 1901.

either through the nostril or an artificial opening, or by turning the tip upward solutions can be thrown into the upper part of the nose and the ethmoidal cells thus indirectly medicated.



Fig. 93.—Bishop's antrum spray (Jour. Am. Med. Assoc., July 13, 1901).

DISEASES OF THE TONSILS.

The Pharyngeal Lymphoid Tissue (Adenoids) with Especial Reference to Primary Tuberculosis.—A. J. Lartigau and M. Nicoll, Jr.,¹ present an elaborate article based on the study of 75 consecutive specimens obtained from several sources in New York city. The children from whom the specimens were obtained were, so far as could be ascertained, aside from the adenoid trouble, quite healthy. Of the 75 specimens tested 12 induced tuberculosis in inoculated animals; hardened specimens of 8 of the 12 contained tubercle bacilli and lesions more or less characteristic of tuberculosis; the other 4 showed bacilli but presented no evidence of tuberculous lesions. Of the inoculated animals, 2 showed tuberculosis at the seat of inoculation; 2 developed tuberculosis at the seat of inoculation in lymph-nodes, 1 developed the disease at the seat of inoculation and in lymph-nodes and in the spleen, 2 developed it at the seat of inoculation and in the abdominal glands, and the remaining 5 manifested general tuberculosis. The writers conclude: (1) Adenoids consist essentially of hyperplastic pharyngeal lymphoid tissue. The epithelium and fibrous tissue changes are inconstant and variable, and independent of the age of the patient. The new-formed fibrous tissue is largely perivascular in distribution. It may occasionally be one of the factors in the process of disappearance of the adenoid. (2) The hyperplastic pharyngeal tonsil often contains microorganisms, and these are mainly pyococcal forms. The bacteria

¹ Am. Jour. Med. Sci., June, 1902.

for the most part lie near the surface; and the infection usually occurs from the surface, with or without demonstrable lesion of the epithelium. (3) Primary tuberculosis of adenoids is probably more common than most previous studies show. Of our series, 16 % contained tubercle bacilli, 10 % with lesions characteristic of tuberculosis. The tubercle bacilli were present in small numbers. (4) The lesions in primary tuberculosis of the adenoid are generally close to the epithelial surface and focal in character. Occasionally they may be found in the deeper parts of the pharyngeal lymphoid tissue. (5) The pharyngeal tonsil may be a portal of entry for the tubercle bacillus and other micro-organisms in localized or general infections.

Changes in the Facial Bones Due to Adenoids.—A. T. Mitchell¹ refers to the dental importance of the changes produced in the alveoli by interference with nasal respiration. The elevation of the palate results in a narrowing of the alveolar arch, and, as the teeth develop, its forward extension. He points out the futility of attempting to correct malpositions of the anterior teeth, the ones usually affected, without previous removal of the obstruction to free nasal respiration. [The effect of an obstructed nasal respiration on the development of the facial bones has long been recognized and many articles have been written on the subject, to which Mitchell makes no reference.]

Morbid Conditions Simulating Adenoids.—Wyatt Wingrave² gives the following list of conditions producing the symptoms usually associated with and ascribed to the presence of adenoids: (1) Diminutive choanæ and nostrils; (2) low vault of the nasopharynx; (3) paresis of the soft palate and pharynx; (4) vomerine crest; (5) distortion of the vertebral column.

False Adenoids.—Natier³ speaks of the presence of false adenoids in neurotic children, causing a train of symptoms usually attributable to the postnasal condition. He produced a cure by properly directed general treatment along with breathing exercises, and warns against any operative interference.

Accidents Attending Adenoid Operations.—Both Christian R. Holmes and H. S. Garlich⁴ report the breaking of a curet after its introduction into the nasopharynx. In Holmes's case, a girl of 8, chloroform anesthesia was used and the curet broke just as pressure was being made. The fragment was drawn down into the oropharynx with much difficulty and removed with forceps. In Garlich's case no anesthetic was used, and when the instrument broke the fragment was swallowed. Suitable diet was ordered, and 3 days later the broken piece, which measured $\frac{1}{2}$ inch in length by $\frac{1}{16}$ inch in breadth, was passed in the stools.

The Use of A. C. E. Mixture and Ethyl Bromid in Adenoid Operations.—J. W. Gleitsmann⁵ states that he has practically abandoned

¹ Jour. Am. Med. Assoc., July 27, 1901.

² Jour. of Laryngol., Rhinol., and Otol., Sept., 1901.

³ Trans. Laryngol. Soc., Paris, May, 1901.

⁴ Laryngoscope, May, 1901.

⁵ Med. Rec., Nov. 2, 1901.

the use of A. C. E. mixture in favor of ethyl bromid. The child is held by an assistant, who sits in a chair, and the mask used is tightly pressed over the child's nose and mouth so as to exclude the air almost completely. The introduction of the mouth-gag usually arouses the child somewhat, but a few more whiffs soon cause the abolition of muscular tonus. This will give sufficient time to remove not only the adenoids, but also, should it be necessary, the tonsils.

A New Adenoid Curet.—W. S. Samson¹ describes a new adenoid

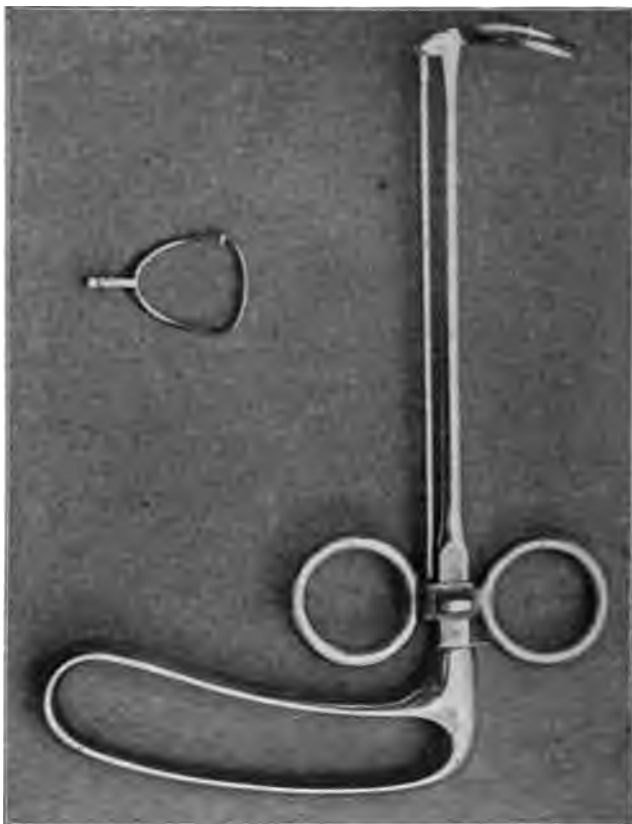


Fig. 94.—Samson's adenoid curet (Jour. Am. Med. Assoc., Nov. 9, 1901).

curet (Fig. 94). The main shaft of the instrument is 14 cm. long and attached to a pistol-grip. Upon the shaft rests a slide with two rings for the index and second fingers. To the slide is attached a second shaft, by means of which the blade can be moved 40 degrees forward and backward when traction is made upon the rings. The blades, two in number, resemble the Gottstein blade in general conformation. The dull blade has no cutting edge; the horizontal portion

¹ Jour. Am. Med. Assoc., Nov. 9, 1901.

is round and the size of No. 16 piano wire. The knife-blade resembles the blade of the Gottstein curet very closely, except the knife, which is only 2 mm. wide. The fenestrum of each blade measures 16 mm. transversely and 20 mm. longitudinally. The dull blade is to be used on soft growths and especially in young children; the knife-blade is for tough and highly organized adenoid tissue. The cardinal feature of the instrument is that the shaft can be maintained at the same relative position, and the blade brought against the choanæ and then swept over the vault, embracing the largest growths; by greater traction on the rings the blade is brought against the pharyngeal wall, and by an upward movement of the hand the cutting-edge is carried as low as desired. The procedure may be repeated as often as necessary without removing the instrument from the nasopharynx. The instrument is aseptic, and the blades are interchangeable.

A New Adenoid Curet Forceps.—W. A. Martin¹ describes the

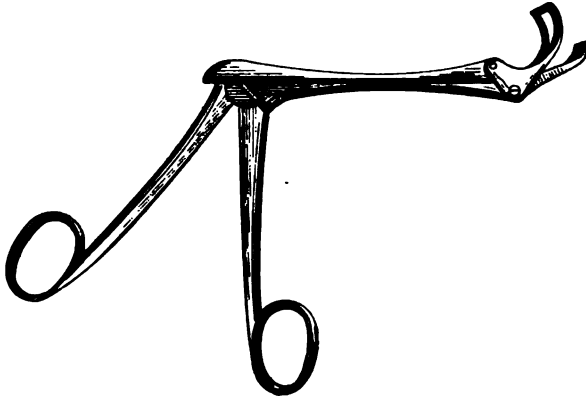


Fig. 95.—Martin's adenoid curet forceps (*Jour. Am. Med Assoc.*, May 31, 1902).

instrument which is herewith illustrated (Fig. 95). As advantages he claims that in the majority of instances it will remove the entire growth in one piece, that its use will reduce hemorrhage to a minimum, and that when used with ordinary skill no injury can be done the septum, turbinates, or pharyngeal wall. The instrument is made in two sizes, but the inventor has found that the smaller size works satisfactorily in all cases.

Tonsillar Inflammations.—W. G. Bissell² objects to the present nomenclature of tonsillar diseases, and would classify them from a standpoint which would describe their microorganismal pathology. Tonsillitis follicularis simplex would signify an inflammation of the tonsil confined to the follicles as far as exudation is concerned and without known microorganismal origin. Tonsillitis diphtheriticus would be that form of tonsillitis which on cultural examination showed the presence of the Klebs-Löffler bacillus. A third form would be that

¹ *Jour. Am. Med. Assoc.*, May 31, 1902.

² *Med. News*, May 31, 1902.

in which bacteriologic examination reveals the presence of *Streptococcus pyogenes* to the exclusion of other organisms, while a fourth class would be those tonsillar inflammations produced by the micrococcus of sputum septicemia. Another is that form of tonsillar infection produced by *Oidium albicans*. After discussing the treatment, prognosis, etc., Bissel proceeds to describe a disinfection apparatus (Fig. 96) which has lately been placed on the market. It consists of a candle of para-

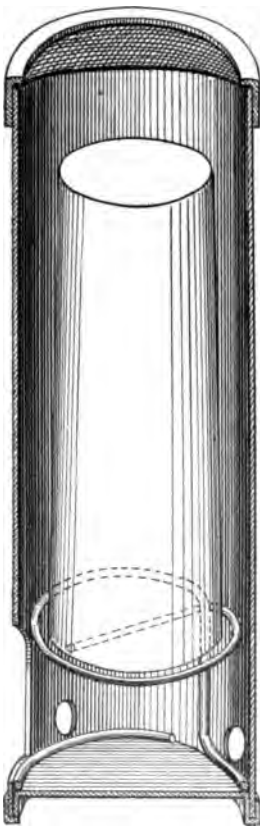


Fig. 96.—Bissel's formaldehyd lamp
(Med. News, May 31, 1902).

formaldehyd which can be used in the same manner as those composed of sulfur. It consists of paraformaldehyd incorporated with a small proportion of paraffin and is compressed into candle form. It is made in two sizes. In using the candle it is placed in a tin container or burner to which but a limited amount of oxygen has access, in order to maintain combustion only at the bottom of the candle; by burning it in this manner the heat produced causes the solid paraformaldehyd to revert to the gaseous formaldehyd. The oxygen supply is limited because paraform burns so freely that the flame would extend over the entire surface of the candle unless some such procedure were adopted; and were such free combustion allowed, the gas would be converted into carbon dioxide and water, and thus rendered valueless for disinfecting purposes. The smaller-sized candle of the two contains about 350 grains of paraformaldehyd, and when properly ignited generates sufficient gas for the surface disinfection of a room with a cubic capacity of not over 300 feet; and by adding one candle for each additional 300 cubic feet, this method can be relied upon for surface disinfection with rooms of a cubic capacity of not more than 3000 feet. In rooms beyond this size formaldehyd cannot be relied on as a disinfectant because it cannot be diffused rapidly enough to obtain the concentration necessary to insure constant results. In using this method

the room should be made as nearly air-tight as possible, there should be one small candle to each 300 cubic feet, the surfaces of articles to be disinfected should be freely exposed to the gas, the room should not be disturbed for from 6 to 12 hours, and a supplementary cleansing process should follow. In rooms having china, marble, or any glazed surfaces, subsequent washing with germicidal solutions, such as formalin and carbolic acid, should be employed.

The Treatment of Acute Amygdalitis.—S. Floersheim¹ suggests

¹ N. Y. Med. Jour., Oct. 1, 1901.

the local application of pure tincture of iodine in acute catarrhal and follicular tonsillitis. The whole inflamed area in the pharynx is freely painted with the official tincture of iodine, and should the intense burning remain more than 2 minutes a gargle of plain warm water will relieve the discomfort. If no burning is experienced, the painting is repeated in a few minutes. Floersheim states that most gratifying results, both subjective and objective, have followed this method of treatment. [Great caution should be exercised in applying to the pharynx such an acrid remedy as tincture of iodine, since its tendency to produce severe and even fatal spasm of the glottis is well known, and with the pharynx in a highly irritable condition and with deglutition impaired the entrance of a drop or two of the tincture into the larynx would very likely occur.]

Lacunar Keratosis of the Tonsil.—George B. Wood¹ discusses the various theories advanced regarding the etiology of this condition, and comes to the following conclusions: (1) The disease commonly called mycosis pharyngitis leptothrica is a true keratosis of the epithelium lining the tonsillar crypts. (2) *Leptothrix buccalis maxima*, *Bacillus buccalis maximus*, and like organisms do not possess any etiologic importance, but are present simply as saprophytes. (3) The disease is probably the result of a moderate degree of inflammation of the parenchyma of the tonsil, causing an increased growth of the normal epithelium of the crypts.

Mycosis of the Tonsils, Palate, and Base of the Tongue.—E. H. Griffin² reports a case of a woman school-teacher who suffered from extensive mycosis of the upper air-passages, including the soft palate, tonsils, and the base of the tongue. The condition was finally eradicated by means of frequent tobacco-smoking and forcible removal of the growth, followed by cauterization of its former site with chromic acid. There was used also a gargle made as follows:

Iron chlorid	12.0 (℥ iij)
Glycerin	60.0 (f 3 ij)
Water enough to make	90.0 (f 5 ij)

One dram of this was used as a gargle every 3 hours and then swallowed. Griffin states that tobacco-smoking may be a strong element in preventing the development of the disease in men, as all the cases he has treated, more than 50 in number, have been in females.

Peritonsillar Abscess.—D. M. Barstow³ states that the origin of peritonsillar abscess appears to lie more in the supratonsillar recess than in the tonsil. He recommends free opening up of the recess so as to afford effective drainage and facilitate the return to normal of its diseased mucous membrane. Anesthesia is produced by the injection of cocaine into the tonsil and the peritonsillar regions, after which the plica triangularis is separated at its base from the anterior pillar by an incision made from above downward with a bistoury. The whole upper part of the tonsil is then, by means of a Myles tonsil punch,

¹ Univ. of Penna. Med. Bull., Jan., 1902.

² N. Y. Med. Jour., Dec. 14, 1901.

³ Med. Rec., April 19, 1902.

removed piecemeal, together with a portion or the whole of the plica triangularis.

An Unusual Anomaly of the Fauical Tonsil.—George L. Richards¹ reports a case of a woman of 60, who gave a history of very long-standing discomfort in the region of each tonsil. On attempting to remove the right tonsil with a tonsillotome it was found impossible to cut through it. Digital examination showed the presence of a bony mass penetrating the tonsil almost to its outer border. This was removed by means of a strong bone-cutting forceps, and on examination proved to be a portion of the styloid process. Examination of the other side with the finger showed that the same condition prevailed there, although the tip of the process was not so prominent.

Tonsillotomy Rash.—Wyatt Wingrave² reports 34 cases in which this rash appeared. The eruption generally appears on the second or third day after operation, and is either papular, roseolous, or erythematous. It is found most frequently on the neck, chest, and abdomen, and occurs sometimes on the face and extremities; it generally lasts 2 or 3 days, but may remain as long as 5. After reaching its greatest intensity it disappears rapidly and is not followed by desquamation. It may occur at any age and is sometimes associated with intense itching.

Hemorrhage after Tonsillotomy.—Seifert³ states that hemorrhage usually comes on soon after the operation, although it may be delayed as long as a week. The most prominent causes are injury of the tonsillar artery, atheromatous change in the vessels, hemophilia, or injury of an abnormally placed internal carotid. [No authentic case of injury of the internal carotid during tonsillectomy is on record.] Should any of these conditions be suspected, Seifert recommends that the tonsil be pressed forward from the outside, that only three-fourths be removed, and that the operation be done with the galvanocautery snare. After the operation complete rest, the sucking of ice, and gentle gargling are recommended, along with the local use of a saturated solution of chromic acid applied on cotton-wool. Digital or forceps compression with lint soaked in ergotin, the cautery, the insertion of a deep suture, or the grasping or twisting of the bleeding point with forceps are additional methods suggested. He advises the use of the galvanocautery in evacuating the pus of a peritonsillar abscess.

A Snare Guard for Ecrasement of the Tonsils.—O. T. Freer⁴ describes a snare guard for Ingals's operation for ecrasement of the tonsils. The wire is inclosed in a ring which is passed over the tonsil as it is held by the forceps, and the effective use of the loop is thus very much facilitated.

¹ Jour. Am. Med. Assoc., July 27, 1901.

² Jour. Laryngol., Rhinol., and Otol., Oct., 1901.

³ Wien. klin. Rundschau, No. 15, 1901. ⁴ Jour. Am. Med. Assoc., Aug. 17, 1901.

DISEASES OF THE PHARYNX.

The Treatment of Nasopharyngeal Fibromas.—Schäffer¹ described 5 cases of this disease and illustrated the method of Partsch, which was successfully applied in 1 case, before the Laryngological and Otological Society of Munich. Partsch's method is as follows: The upper lip is raised and an incision through the mucous membrane is made above the alveolar border of the upper jaw, extending from the second molar tooth on one side to the same point on the opposite side. The soft parts are pushed up from the bone, which is then divided all the way around above the apices of the roots of the teeth. The septum is cut with a broad chisel just above the floor of the nose and the maxillar divided as far back as the tuberosities (with the exception of the mesial antral wall, which can be cut either by a chisel or by a small saw after the pattern of Hey's). A moderate amount of pressure will depress the whole of the hard palate and alveolar arch like a trap-door hinged at the posterior end. Good access to the nasopharynx is thus obtained and the growth removed. When the parts are replaced, the original incision through the mucous membrane is closed by a continuous suture. In the case reported by Schäffer bony union was complete in a month.

Sclerotic Hyperplasia of the Pharynx and Nasopharynx.—A. Brown Kelly² describes what he believes to be a condition hitherto unrecognized. The patient was 34 years old, for about 8 years had been subject to slight sore throat, and for the last 3 years had felt a general thickened condition in his throat. The uvula was greatly enlarged, there was a thick band on the posterior wall of the pharynx on each side of the median line, and thickening of the roof and floor of the nasopharynx to so great an extent as to lead to a marked diminution of its lumen. The disease developed very slowly and consisted in diffuse uniform thickening which histologic examination showed to be a marked interstitial hyperplasia. The condition must be differentiated from rhinoscleroma and hereditary and tertiary syphilis.

Lithemic Pharyngitis.—J. A. Stucky,³ before the American Laryngological, Rhinological, and Otological Society, stated that uric acid excites inflammatory reaction in mucous membranes. The local manifestations of the lithemic diathesis are not confined to the pharynx, but may appear in the nasal and gastrointestinal tracts. The symptoms complained of are a sense of fulness in the throat, increased by swallowing, with a feeling of rigidity associated with heat and dryness. Elevation of temperature is usually slight. There is redness and swelling, particularly behind the posterior pillar of the fauces, and the uvula is often rigid, swollen, and edematous. The attack sometimes immediately precedes the onset of articular rheumatism. The value of local treatment is slight; cleansing of the nose and pharynx with a hot alkaline solution affords a certain amount of relief. Systemic treatment is

¹ Jour. of Laryngol., Rhinol., and Otol., Mar., 1902.

² Lancet, April 6, 1901. ³ Jour. of Laryngol., Rhinol., and Otol., Nov., 1901.

the more important, and should include the use of drugs which increase the alkalinity of the blood; the salicylates, with small doses of pilocarpin, should be administered until the skin acts freely. Attention should also be directed to diet, exercise, and conditions which govern the general bodily condition.

The Acute Retropharyngeal Abscess of Infants.—S. V. Pearson,¹ in discussing the treatment of this disease, states that if the constitutional symptoms are slight and the swelling small, the treatment should be expectant. Any nasal disease present should receive attention and a mild purge should be administered. In other cases operation should be resorted to, and, except in the very worst, is not necessarily immediate. By waiting for a short time the child's general condition can be improved, the swelling studied, and its progress noted. If the dyspnea is marked, a steam-kettle with a curtain over the head of the bed is of value, and a drop or two of wine of antimony added to salt water is of service in easing respiration and counteracting any spasmodic element which may be present in the dyspnea. The method of operating recommended is that which opens the abscess behind the sternomastoid by Hilton's method. When the abscess is opened in the pharynx, a certain amount of pus is necessarily swallowed not only at the time of operation, but also afterward, particularly during irrigation of the cavity. The after-treatment when the external operation is adopted is much more satisfactory than when the incision is made through the pharyngeal mucous membrane. The incision should be behind and parallel to the sternomastoid muscle, and its center should correspond as nearly as possible to the level of the center of the swelling. After cutting through the skin and fascia and exposing the posterior border of the sternomastoid, being careful not to wound the spinal accessory nerve, the knife should be dispensed with and the operation continued by means of a blunt dissector and dissecting forceps. At this point of the operation it may be necessary to remove one or two enlarged lymphatic glands belonging to the postcervical chain. By means of careful blunt dissection the tissues should be separated until the prevertebral region is reached, the landmarks of which are the transverse processes and anterior surface of the bodies of the cervical vertebrae. To avoid injury to the internal jugular vein and the cervical sympathetic nerves, the operator should keep well back against the vertebral column. At this stage of the operation it is recommended that the patient be allowed partially to recover from the anesthetic, when further progress is facilitated by introducing a finger into the mouth and another into the wound. This will enable one to define with considerable exactness the extent and limits of the abscess-cavity. Then a blunt dissector with a fairly fine point, or some similar instrument, can be passed along the finger in the wound and the abscess punctured; the opening can be enlarged by introducing a pair of sinus forceps and thus allowing free evacuation of the pus. The cavity should be irrigated with an antiseptic solution and a very small drainage-tube should be introduced to the bottom

¹ *Lancet*, Oct. 26, 1901.

of the wound. The upper and lower edges of the incision are brought together by sutures and an antiseptic dressing applied. The drainage-tube should be left in for from 2 to 3 days and the cavity gently syringed with 1 : 4000 mercuric chlorid biniodid solution, and after that with a weak solution of iodine. During the first day following the operation the wound should be dressed twice, but after that once daily is sufficient. After the tube has been removed a small plug of gauze is introduced and shortened every other day.

Angina Due to Friedländer's Pneumobacillus.—Descos¹ reports a case of this rare disease, the twenty-third in all that has been published. His patient was a man of 38, who was admitted to the hospital suffering from advanced pulmonary tuberculosis. On complaining of slight dysphagia his throat was examined a few days after admission and there were found several small, grayish, slightly elevated spots on the left half of the soft palate and the left anterior faucial pillar. They gradually spread and eventually coalesced so as to form a false membrane which covered the left tonsil, left anterior pillar, soft palate, and uvula, finally extending to the right anterior pillar and tonsil and eventually covering the whole isthmus and the posterior part of the gums. There was practically no pain and the dysphagia was entirely mechanical. The pseudomembrane was so tenacious that swabbing removed only the superficial portion, and in order to ablate it entirely curettage was necessary. The underlying mucous membrane was swollen and bleeding. On bacteriologic examination the deeper portions of the membrane were found to be swarming with Friedländer's pneumobacilli, while the superficial portion was more or less deficient in microbes, containing the pneumobacilli along with a few cocci, filaments, and spirillas. No tubercle or diphtheria bacilli were found.

Aneurysm of the Internal Carotid Artery.—W. B. Johnson² reports a very interesting case of this rare condition. The patient was an Italian child, aged 4, with a negative family history. There had existed a suppurative otitis media for about a year, and at the present attack there was swelling in the left tonsillar region accompanied by the usual general and local symptoms of peritonsillar inflammation. An Italian midwife attempted to relieve the condition by rupturing the swelling with the finger-nail, with the result that a little blood and some pus was discharged. Within a few hours a considerable hemorrhage started in the left ear, which lasted about 15 minutes. On the following day it was decided to incise the swelling in the tonsillar region, and while the tongue was being forcibly depressed a sudden gush of blood occurred from the left ear and was so profuse as to saturate 6 large towels. Examination of the ear, after the hemorrhage had ceased, showed the inferior wall of the external canal pushed up to such an extent as to render the tympanic membrane invisible, and below the ear was a tense somewhat triangular swelling, nonpulsating and about the size of an egg. No bruit could be heard over the swelling. In the left tonsillar region there was a large, tense, not easily compressible,

¹ La Presse Méd., Mar. 5, 1902.

² Am. Jour. Med. Sci., Sept., 1901.

nonpulsating, dusky red tumor, which extended downward toward the larynx and upward behind the left faucial pillar into the nasopharynx; at its most prominent portion it projected beyond the median line. On its anterior surface was an abrasion, which was probably caused by the attempt made to relieve it, and from this point there was no hemorrhage. A diagnosis of dissecting aneurysm was made and the condition thought to be due either to ulceration of the blood-vessel from tonsillar disease or to trauma at the hands of the midwife. Six days later there was another marked hemorrhage from the ear, and this was succeeded for several days by a constant discharge of bloody serum. The condition was very much improved 2½ weeks later; the swelling in the canal had decreased and at the margin of the tympanic membrane, which was the seat of a large perforation, there were two points from which a thick serous fluid exuded. The patient was again seen 10 days after this, and was found to be suffering from dyspnea and was drowsy and stupid. The tumor had increased very much in size and a hemorrhage had probably taken place which dissected downward and encroached upon the lumen of the larynx. Tracheotomy was performed 2 days later, and the tonsil, which was atrophied, was dissected from the tumor mass. The tumor was punctured on the anterior and posterior surfaces and a small quantity of blackish, semi-disorganized blood withdrawn. Examination of the tonsil showed that there was no evidence of carcinoma or of tuberculosis. On the day after the operation respiration through the cannula was satisfactory and the drowsiness and stupidity disappeared. The left eye was slightly paralyzed and the pupil moderately dilated. There was decided improvement 11 days later; respiration was comfortable with the tracheal cannula closed and the tumor had decreased to about half its original size. A month later the patient returned to the hospital with a severe bronchitis and still wearing the cannula. About a month after this the tumor suddenly increased in size and there was a profuse hemorrhage from the nose; this gradually subsided and the child slept for about 2 hours, when there was another profuse hemorrhage from the mouth and nostrils to the extent of more than a quart of blood. His condition next day was such that ligation of the common carotid was not considered advisable. Another hemorrhage took place, and on the following day the patient died of exhaustion. No autopsy was permitted.

The Rhinopharyngeal Origin of Goiter.—Du Foy¹ relates the results of 5 years' experience in the treatment of over 200 cases of goiter in which there were associated nasopharyngeal lesions. Of these, 52 were entirely cured by proper nasopharyngeal treatment lasting from 1 to 8 months. In 133 cases of long standing, either fibrous or cystic in variety, there was considerable reduction in size. Some of over 20 years' duration were reduced from 2 to 4 inches. In 24 cases the amount of improvement was very slight. In all these cases there had been a previous congested condition of the nasopharynx,

¹ *Le Progrès Méd.*, May, 1901.

which affected the thyroid through the venous anastomosis described by Bimar and Lateyre. The nasal treatment was very simple, consisting of a 10 % menthol spray 3 times a day and a 50 % solution of chromic acid used as a caustic for redundant tissue.

Orthoform Lozenges for the Relief of Painful Swallowing.—S. Solis Cohen¹ states that orthoform applied in various ways is probably the best agent now available for the temporary relief of the pain attending inflammatory and ulcerative affections of the throat. The drug is administered in the form of lozenges containing from $\frac{1}{4}$ to 1 grain, with which in some cases adrenal extract has been used. It is of especial benefit in tuberculous laryngitis, and it has been found that the administration of these lozenges 10 minutes before meals has reduced to a minimum the discomfort attendant upon swallowing.

DISEASES OF THE LARYNX.

The Local Treatment of Laryngeal Tuberculosis.²—M. Hunt divides the cases coming for treatment into two classes according as the treatment indicated is curative or palliative. By curative treatment is meant treatment that is essentially surgical, and consists in the removal of all diseased tissue, either by cutting instruments or by means of caustics such as lactic or chromic acid. Palliative treatment embraces the various antiseptic and local anesthetic measures, and is surgical only when the necessity arises to relieve some such imperative symptom as dyspnea or severe dysphagia. The cases suitable for curative treatment are those in which the disease is limited, situated preferably intralaryngeally, and of a hypertrophic form, cases in which the pulmonary disease is slight and either stationary or progressing very slowly, the general appetite and health good, fever absent, and the patient of a courageous and sanguine temperament. When, on the other hand, there is extensive ulceration or infiltration, especially when associated with much edema or perichondritis, when there is high fever, loss of appetite, advancing pulmonary involvement, or evidence of the patient being deeply stricken, the treatment indicated is strictly palliative. In the curative treatment the curet, the cutting forceps, and lactic acid are used, the choice depending on the nature and situation of the lesion. Should the mucous membrane be unbroken, lactic acid will not be efficient in removing infiltration. When there is a well-defined or limited infiltration without ulceration, a mass of granulation-tissue, or a distinct tumor, thorough removal by means of the curet should be adopted, followed by application of lactic acid. Hemorrhage following curetment is ordinarily of trifling moment, but after the use of the cutting forceps, it is occasionally somewhat free. Other methods, such as scarification, followed by the rubbing in of lactic acid, or the submucous injection of creasote, iodoform emulsion, lactic acid, or

¹ Amer. Med., Nov. 9, 1901.

² Discussion at Annual Meeting of the Section on Laryngology and Otology, British Medical Association, 1901. Jour. of Laryngol., Rhinol., and Otol., Oct., 1901.

zinc chlorid, have been practically abandoned. Should ulceration be present and superficial and not too extensive, particularly when situated on the vocal cords, ventricular bands, or posterior wall, lactic acid alone will usually be sufficient to induce healing, and is the best application at hand for treating tuberculous ulceration of the larynx. As it is to be used as a destructive agent and not as an antiseptic, it should be employed in a strength of not less than 50 %, rapidly increasing the strength until finally the pure acid is used. It should not be applied frequently, but after the ulcerated surface has been thoroughly rubbed with a strong solution the application should not be renewed until the resulting slough clears off—probably a week or 10 days. Used in this way, 3 or 4 applications are usually sufficient to secure cicatrization. Rarely cases will be met in which the strong solutions are not tolerated, when resort must be had to weaker solutions—20 % to 30 %. The healing of deep, granulating ulcers of limited extent will be promoted by first thoroughly cureting the surface before the strong acid solutions are applied. In those cases in which the more radical forms of treatment cannot be adopted, and in which the inflammatory edema demands attention, palliation is the best that can be done. The edema, which is often the cause of the difficulty in respiration and swallowing, is due to secondary infection by streptococci and staphylococci, and may be prevented or rendered stationary by the local application of such antiseptics as menthol, carbolic acid, iodoform, etc., applied by swab, spray, injection, or inhalation. The surgical means to be adopted in the palliative treatment comprise the incision of an inflamed and edematous arytenoid or epiglottis; the punching out of a painful ulcer on the edge of the epiglottis or on the arytenoid; tracheotomy to relieve dyspnea; thyrotomy when intralaryngeal operation cannot be effective; and rarely partial laryngectomy, which might be indicated when there is severe one-sided disease of the larynx with absence of pulmonary involvement and a good state of the general health.

B. J. Baron said that as regards curability of the disease, success is possible only when there is a favorable pulmonary and constitutional stage, and only in a small proportion of cases in which the lung and larynx are both diseased. The aim of local treatment is threefold: first, by means of direct surgical and topical medicinal treatment to destroy the tubercle bacilli; second, to restore the natural resistance to disease, and so indirectly destroy the bacilli by giving rest to the larynx and protecting it from irritation and inflammation, and to prevent spread by aiding the tissues not yet attacked to retain their health; third, to ameliorate symptoms, especially dysphagia, in cases in which it is impossible to accomplish much under the first and second heads. The best results are seen in those cases in which ulceration has taken place, and it is difficult to say how much benefit can be afforded by local medication in the preulcerative stage of the disease. In the first stage, when simply inflammation with slight, if any, infiltration is present, treatment should be of the mildest form, and should consist in giving such instruction to the patient as will secure rest of the larynx.

In the infiltrative stage the general indication to be met is protection from irritation, which should include conservative use of the voice, avoidance of irritating articles of food and drink, of tobacco-smoking, and of the inhalation of irritating chemical substances or dust. The inhalation or intratracheal injection of soothing antiseptics, such as benzoin, creasote, menthol, or menthol and guaiacol, is of benefit. For the purpose of checking the cough, pastils or lozenges of codein, cocain, menthol, or antipyrin are beneficial. Submucous injections of cocain, guaiacol, lactic acid, mercuric chlorid, etc., are not recommended, as it is doubtful whether the bacilli are directly acted upon and there is a risk of setting up or increasing local inflammation, which would only make the tissues less resistant. For the dysphagia, cocain or eucain should be used, and the addition of soda sulfate to cocain hydrochlorate, as advised by Wingrave, increases the analgesic property of the latter and enables a weaker solution to be used. In the third stage, that of ulceration, curettage followed by thorough rubbing-in of lactic acid is advisable, beginning with a 50 % solution and increasing as rapidly as possible to full strength. The daily insufflation of resorcin, 1 part, and orthoform, 2 parts, produced excellent results in a case of extensive ulceration. Contraindications to surgical treatment are advanced and progressive pulmonary disease with high temperature, night-sweats and emaciation, and acute laryngeal inflammation, especially perichondritis. For the relief of pain orthoform insufflated or sprayed in the form of an emulsion is most satisfactory, as the anesthesia lasts longer than that produced by menthol, eucain, or cocain, and the drug is practically not poisonous.

Lake discussed the **indications for operative treatment**, confining his remarks to the use of scraping and cutting instruments. Briefly summarized, the contraindications to operative procedure are: "Advanced pulmonary phthisis, with hectic and wasting; diffuse miliary tubercle of the larynx; all cachectic conditions; severe stenosis of the larynx, caused by inflammatory swelling; and in nervous and timid patients, especially in those whose condition promises little hope of recovery (Heryng)." In not more than 15 % of all cases of tuberculous laryngitis is a cutting operation required or will it accomplish more than milder means. The chief point influencing a decision as to the method of treatment to be adopted is the condition of the lungs; rapidly extending disease and general miliary tuberculosis are distinct contraindications, while a tendency for the disease to become stationary, limited in extent, or chronic would favor the chances of obtaining good results in the throat. With the exceptions of operations for the relief of pain, the less curative surgical work done when the pharynx, palate, and base of the tongue are involved, the better. Operations should not be done unless the temperature is steady, an exception of course being an irregular temperature the rises in which are chiefly or entirely due to the laryngeal condition. In connection with this it is interesting to note the effect of operation on temperature. Of 35 cases, but 4 showed any postoperative rise, and in these it was not necessarily due to trauma,

but may possibly have been caused by neurotic influences. The sole local contraindication is acute miliary tuberculosis of the larynx. Pain, dysphagia, or dyspnea invariably call for operative interference when other means have failed to afford relief, and it is for the relief of dysphagia that removal of the epiglottis is particularly justifiable. This procedure affords immense relief to the dysphagia, the patient's general mental condition is improved, and life is undoubtedly prolonged to the extent of 1 or 2 months. The mildest form of operative treatment is the submucous injection of fluids, and the action of all on the tissues is the same: first, a local hyperemia and then a submucous contraction by organization and contraction of the small-celled infiltration. Lake uses only a 5 % solution of zinc chlorid. The needle should be deeply buried and introduced only where the tissue is deep, and reactionary swelling will not be of serious import. This procedure is of special value in subglottic thickening or in swelling and ulceration of the ventricular bands, especially in the two former when due to perichondritis. The injection should not be made where the tissue is shallow and the possibility of swelling absent, as under these circumstances extensive sloughing will occur. Scarification and incision are indicated chiefly in edema of the arytenoids and ventricular bands. Galvanopuncture has many indications in common with submucous injection, but has the added advantage of being applicable in places where the tissue is shallow; extensive subglottic infiltration may be relieved by this means. The galvanocautery point can be applied on the surface, especially in the subglottic region, to swellings which cannot be removed by means of the forceps. The galvanocautery snare is useful for the removal of the epiglottis, but otherwise is likely to prove of little value in tubercular laryngitis. The curet is of value in the removal of granu-lomas from the region of the vocal process, for scraping away granu-lation tissue from the base of ulcers on the ventricular bands and posterior surface of the epiglottis, and less frequently for the cureting of ulcers on the vocal cord and in the interarytenoid commissure. The use of the punch forceps is confined to swellings with or without ulceration occurring more especially in the posterior half of the larynx, including the arytenoids, the space between them, the arytenoepiglottic folds and large hypertrophies of the ventricular bands. These operations are not painful and seldom have any bad local after-effects. The amount of local anesthetic required is usually quite small, and not only the larynx, but also the regions around it, should be painted, the operation to be performed as soon as possible after the induction of anesthesia, as in tuberculous patients there seems to be a tendency to the establishment of an intolerance of eucaïn and cocain. Tracheotomy as a curative measure should not be employed, but in cases of laryngeal stenosis in which there is a double syphilitic and tuberculous infection it is most valuable. Laryngofissure would be ideal if the infection of the larynx were primary, but the risk of this not being the case, and the consequent exposure of a large raw surface to the action of the bacillus, would render the procedure exceedingly dangerous. The after-

treatment necessitates no change in the line previously followed. The raw surface should be freely rubbed with some antiseptic, preferably 5 % to 7 % formalin solution, and if the site of the operation be the ventricular bands or epiglottis, equal parts of orthoform and amyloform should be insufflated, to be repeated as necessary. The patient is instructed not to talk or move about for half an hour after the operation, no further restrictions being placed on his actions.

A. McCall described a case in which there had been **ulceration with granulations** which had been treated by insufflations of resorcin and orthoform in proportions varying from one-third to two-thirds. Treatment had been administered on alternate days, and the result was a cure, the larynx showing clear white scars in the anterior and posterior commissures, accurate approximation of the cords on phonation, and only slight swelling in the interarytenoid space. The result of considerable experience with this form of treatment showed that it was of great value in those cases in which curetment is usually done, viz., those cases presenting ulceration with granulations. In cases of flat superficial ulceration such as are commonly found on the epiglottis, orthoform alone, or in combination with bismuth, morphin, or cocain, proved to be of greater value than the orthoform-resorcin combination.

J. Horne stated that he had found **tuberculin of value** in cases in which there was great destruction of tissue. It seemed to put the ulcers in a condition which made them respond more readily to surgical treatment.

P. W. Williams had had a **number of successful results** which he divides into two classes: those in which there had been a tuberculous neoplasm, either mammillated or papillary hypertrophy, or the most distinct, but much more rarely defined neoplasm; and those in which there had been localized deposits. When there was present a definite neoplasm or an ulcerated deposit, removal of the deposit, followed by the application of lactic acid, produced very satisfactory results. When there existed a localized infiltration with no solution in continuity of the mucous membrane, curetment was avoided and submucous injections used. The solutions employed were 1 to 2 minims of a 20 % guaiacol or a 1 : 1000 solution of mercuric biniodid. Following the injection was increased local inflammation, which soon subsided, and was followed by relief of the pain, and, after several repetitions of the injection, by either a diminution or disappearance of the deposits. Of great importance is prolonged rest of the larynx; it is not sufficient to prevent speaking, but the patient should not be allowed even to whisper.

St. Clair Thomson emphasizes the **importance of rest**, stating that strict rest of the arytenoid joint was as essentially a form of local treatment as it was in tuberculosis of the knee-joint or hip-joint. Progress in the treatment of tuberculous laryngitis is not to be expected with cases in the third stage, but in making an early diagnosis of the incipient disease. When this is made, sanitarium treatment, accompanied by strict rest for the voice and symptomatic treatment, is required. Statistics

emphasize the necessity of rest, Lake stating that the interarytenoid region was attacked twice as often as the vocal cords and three times as often as the epiglottis, while in 50 consecutive autopsies Fowler found the arytenoid articulation affected in all.

R. Woods showed an **instrument** which he had devised for the purpose of making **local applications of lactic acid to the larynx**. Its shape was like that of a Schrötter dilator, and at its lower end was a circular wick to hold the acid. It was intended to avoid the stoppage of the breath inseparable from applications made by the brush or swab and enable a prolonged application to be made without interfering with the respiration of the patient. When the instrument is in position, the wick lies against the ulcerated surface and the patient breathes through the center of the tube.

De Haviland Hall stated that the energetic use of **lactic acid** had brought about healing in apparently hopeless cases. The larynx should be thoroughly cocaineized previous to the use of lactic acid, which should be used first in a strength of 25 % to 30 % and gradually increasing to 50 % or 60 %, or even 100 %. One case recovered under absolute rest in the open air with the use of a spray of cocain and resorcin, followed by orthoform.

T. M. Howell recommended the **insufflation of morphin or heroin** mixed with sufficient bismuth or starch to make a vehicle. Odynphagia can be materially relieved by placing the palm of each hand, with the fingers pointing upward, over the ears and making very firm pressure while the patient is swallowing; the greater the pressure, the greater the relief to the pain. It is best to stand behind the patient while making the pressure. This method is applicable to any disease attended with painful swallowing.

Tuberculosis of the Larynx in Childhood.—Perrin¹ reviews and analyzes all the cases of laryngeal tuberculosis in children which have been reported up to the present time. In infancy the condition is very rare, but becomes more common with advancing age and reaches its maximum between the ages of 20 and 40. In postmortem examinations of 16,581 cases Frobélius found 10 with laryngeal ulcerations, and in 500 cases of tuberculosis examined during life, Morell Mackenzie found laryngitis in but 1 under 15 years. In 100 postmortem examinations he found involvement of the larynx between 5 and 10 years in 1, between 10 and 15 in 4, and between 15 and 20 in 16 cases. The condition may exist without producing any clinical signs, and the reasons for its comparative rarity are as follows: Tuberculosis during the early years of life tends to become generalized and produce death before there has been time for the larynx to become involved, and in this form there is not present the bronchial secretion to cause infection of the larynx; children are not exposed to a number of those irritating causes, such as smoking and overuse of the voice, which predispose the larynx to infection; the laryngeal symptoms frequently fail to appear until the general condition of the patient is so serious that atten-

¹ Rev. Hebd. de Laryng., etc., Jan. 18, 1902.

tion is not attracted to them; according to Krishaber and Peter, the larynx during childhood is more stable than it is at or soon after puberty, and on that account is less likely to become infected by the tubercle bacilli. The path of infection is not always determinable, but the most frequent method is probably the same as in adults, by means of sputum from pulmonary lesions; and the nearer the age of the child approaches maturity, the more likely is this to be. The next most common path is probably the blood or lymph-stream, the original focus of infection being located in one of the mediastinal glands. The lesion may result directly from a primary tuberculosis in the pharynx, or may be primary. The lesions presented are various, and vary all the way from infiltration to ulceration. The former is quite common, and may be complicated by edema, recovering by a spontaneous process of sclerosis, or going on to ulceration, which is the most common lesion. The ulceration is polymorphous and is found in any part of the larynx, the most common site being the vocal cords. Similar ulcers are frequently found in the trachea, where they usually do not cause any special symptoms. The ulceration often has edema associated with it, and is frequently followed by the formation of cicatricial bands. Granulations are more common in the adolescent than in the very young, although they have been found in infants. Perichondritis is found occasionally, and may be either primary or secondary to the ulcerative process. The rarest form is a discrete or confluent eruption of granulations over the larynx, palate, uvula, etc., the "*granulie pharyngo-laryngee d'Isambert*." As regards the symptoms, when the larynx is affected late in the course of the disease they may be so slight as to attract no attention. Dysphagia and laryngeal pain are rather rare in children, slight hoarseness being more common. Suffocative attacks may come on very abruptly and be so severe as to demand tracheotomy, although a few cases recover without resort to operation. On account of the difficulty in using the laryngoscope in children, the diagnosis is often clouded, and sometimes the presumption of syphilis can be eliminated only by observing the effect of antisyphilitic treatment. Simple papillomas may sometimes suggest tuberculous granulations, but the diagnosis can usually be made by the presence of tuberculosis elsewhere in the body, and in the absence of these, microscopic examination of a piece of ablated tissue may be required. The possibility of cancer can be dismissed on account of its failure to occur in the larynx in childhood. Lupus is very rare in childhood, only 1 case having been reported in a child under 7, and is always preceded by lupus of the face, nose, etc. The suffocative attacks may resemble the various forms of croup, edema, etc., and in the absence of laryngoscopic examination must be determined by the condition of the other organs. The prognosis is very grave, death usually coming on within a few weeks of the appearance of the laryngeal symptoms, not on account of the direct influence of the laryngeal disease, however, but because such symptoms usually appear only shortly before death. Naturally under these circumstances treatment is seldom of any value.

Laryngeal Tuberculosis in Pregnancy.—A. Küttner¹ states his conclusions as follows: "With women in whom the prognosis is hopeless, one should treat laryngeal tuberculosis only in the usual local manner, and, if necessary, perform tracheotomy. With women in whom the general prognosis is favorable, one should wait so long as the laryngeal tuberculosis is quite slight (little erosion, a circumscribed ulcer). So soon as infiltration takes place, or the disease tends to become diffuse, one should inform the patient of the danger of her condition, and after her consent is obtained, undertake tracheotomy as soon as possible; should this not work favorably in a few days, bring about artificial abortion. The earlier the pregnancy is interrupted, the more favorable are the chances for the mother, because the smaller the fetus the less will be the strain of labor, and also the loss of blood which occurs in artificial abortion is proportionately small. From the seventh month of pregnancy the prospect for the mother becomes worse, because great exhaustion usually follows the strain of delivery. It is advisable, with advanced laryngeal tuberculosis, to undertake tracheotomy before delivery, or, at least, to hold one's self in readiness for its performance, in order to obviate the risk of sudden suffocation during delivery."

Von Ruck's "Tuberculin Purificatum."—W. S. Hale² reports a case of tuberculous ulcerations of the septum, ala, upper lip, hard palate, and uvula which was treated with Koch's "new" tuberculin. A moderate degree of improvement resulted. Von Ruck's preparation was then used, starting with a dose of 0.05 cc. No symptoms followed the injections, and under a rapid increase of dosage the ulceration soon ceased and cicatrization began. In 2 weeks all ulceration had disappeared.

Laryngeal Perichondritis in a Diabetic Subject.—A. J. Hutchison³ reports this case: The patient was a schoolmaster, aged 30, who complained of progressive weakness of the throat without hoarseness and of pain on swallowing. Later hoarseness and dyspnea, with dysphagia, to so great an extent as to make swallowing almost impossible, developed. Laryngeal examination showed the left arytenoid region to be congested and swollen, with fixation of the left vocal cord near the median line. The right side showed less change, abduction being incomplete and the movements of the cord slow. Later the condition became much worse, the left side of the larynx showing a large red swelling, which extended from the back of the arytenoid region to the epiglottis and completely hid the vocal cord. The right side was also considerably swollen. Externally there was marked swelling and tenderness over the larynx, mainly on the left side, but extending somewhat to the right. At this time the patient, who had suffered from diabetes mellitus for 5 or 6 years, became comatose and died.

The Treatment of Recurrent Papillomas of the Larynx.—A. Bronner⁴ reports a case of a man of 45 years, both of whose vocal cords

¹ Jour. of Laryngol., Rhinol., and Otol., Nov., 1901.

² Albany Med. Ann., Aug., 1901.

³ Jour. of Laryngol., Rhinol., and Otol., Mar., 1902.

⁴ Jour. of Laryngol., Rhinol., and Otol., Sept., 1901.

were covered with typical papillomas. These were removed by forceps at intervals varying from 2 to 4 months, but in spite of the use of various local remedies, would invariably recur. Finally, after removing a large number of the growths, a spray of formalin, starting with 1 : 1000 and increasing to 1 : 100, was ordered. Four months later a few papillomas were removed, but these were smaller and more rounded than the previous growths. Since then, about 2 years, there has been no recurrence. J. M. Brown¹ reports good results in the use of tincture of thuja occidentalis after the removal of portions of such growths. In several cases in which the condition was recurrent local treatment by thuja after removal of the tumors seemed to prevent any further recurrence.

Dead Bone Wedged in below the Vocal Cords.—Onodi² reports a case of a man of 32, with syphilis of 8 years' standing. He had suffered with laryngeal stenosis 3 years previously, which was ascribed to abductor paralysis on account of the median position of the cords. The immediate condition was cured by injections of mercuric chlorid, but hoarseness remained. A year later some fragments of bone were coughed up, and 2 years subsequent to this he was seized with a violent fit of coughing, which almost resulted in suffocation, and during which he felt a foreign body in his throat. Laryngoscopic examination revealed a brownish, rough body impacted below the vocal cords. Laryngofissure preceded by tracheotomy was performed and a piece of necrotic bone measuring 2 cm. by 1.5 cm. in breadth and 2 mm. to 3 mm. in thickness was removed. One surface of the bone was concave and smooth, while the other was uneven and rough. The dyspnea disappeared entirely after the operation, but there was complete aphonia and almost complete immobility of the arytenoids. The case was evidently one of specific perichondritis of the cricoid, which had caused the dyspnea and median position of the cords 3 years previously. This condition was relieved by the mercuric chlorid injections, but was not cured, as the perichondritis continued, and resulted in the ossification, necrosis, and sequestration of the posterior portion of the cricoid. Small portions of this had been coughed up at the first attack of dyspnea, but the main portion did not become impacted until the last attack. The most interesting point about this case is the mistake in diagnosis of abductor paralysis for perichondritis of the cricoid cartilage; the median position of the cords was due to inflammatory conditions at or near the cricoarytenoid articulations with no suggestive signs visible in the interior of the larynx.

Dislocation of the Arytenoid Cartilage.—Hirschmann³ reports a case of dislocation of the arytenoid cartilage which had existed since childhood in a patient aged 30 years. The symptoms might be ascribed to specific disease, but the history was negative. Left-sided paralysis was thought of, but in this condition the vocal cord is never found in such an extreme position of abduction as was present. An intratho-

¹ Jour. Am. Med. Assoc., Aug. 3, 1901.

² Monats. f. Ohrenheilk., Dec., 1901.

³ Berl. klin. Woch., Jan. 9, 1902.

racic tumor was excluded by x-ray examination. Perichondritis was considered, but in order to lead to such extreme abnormal position through this source serious disturbing processes in the cartilages would have existed at some time, resulting in cicatrices or loss of cartilage, which would hardly have passed unobserved by either parents or patient. Hirschmann concludes that notwithstanding the scarcity of such cases, it was plainly one of luxation of the arytenoid cartilage as a result of traumatism which was inflicted at birth or very early in infancy.

Traumatic Dislocation of the Arytenoid Cartilage.—H. L. Wagner¹ reported this case at the Seventh Annual Meeting of the American Laryngological, Rhinological and Otological Society. The patient was a man of 70 who had received a blow in the throat from a fist. He complained of severe pain on deglutition, but there was no solution in continuity of the mucous membrane, as was shown by the absence of bloody expectoration. Swelling rapidly diminished under alkaline spraying and ice compresses, and examination then revealed dislocation of the left arytenoid cartilage with fixation midway between the respiratory and phonatory positions. There was no fracture of the larynx. Wagner was able to find only one other such case on record.

Fracture of the Larynx.—Arthur W. Watson² reports a case of fracture of the larynx in a boy aged 16, who while riding his bicycle ran into the tail-board of a wagon and struck his thyroid cartilage. Six weeks after the injury the boy began to suffer from dyspnea, and examination of the larynx revealed adhesion between the ventricular bands. This adhesion was broken up, but only slight relief was afforded, and an O'Dwyer intubation tube was then introduced. Five months after the reception of the injury a preliminary tracheotomy was performed, and this was followed 3 weeks later by laryngofissure. The cause of the stenosis was found to lie in the large amount of redundant tissue, which was removed without injury to the larynx. The tracheal cannula was removed several weeks after the operation and the breathing was found to be free and the voice clear and strong.

Excision of the Larynx.—F. G. Harvey³ describes a method of removing the larynx which follows closely that first advocated by Rötter. A vertical incision is made from the hyoid bone to a point opposite the fourth or fifth ring of the trachea, followed by a transverse cut along the whole length of the lower margin of the hyoid bone and including skin and fascia; this severs the anterior jugular veins, which should be at once ligated. The sternohyoid, omohyoid, and thyrohyoid muscles are separated from the hyoid close to their insertion and reflected downward and outward to either side. The isthmus of the thyroid is then divided between ligatures and the lateral lobe separated from the trachea; when the latter is thoroughly cleared, it may be divided from before backward and the lower portion separated from the esophagus and stitched to the skin. All bleeding should be

¹ Ann. Laryngol., Rhinol., and Otol., Sept., 1901.

² Laryngoscope, July, 1901.

³ Lancet, Sept. 21, 1901.

arrested, a Hahn's cannula introduced, and the region surrounding the lower portion of the trachea packed with gauze. The patient should not be deeply under the influence of the chloroform at this time, as warning of blood trickling into the lungs will be given by his coughing, which would necessitate the removal of the cannula and the clearing of the trachea by means of a swab or sponge. The upper portion of the trachea should be dissected from the esophagus and the lateral surface of the cricoid freed from muscles. The lower cornu of the thyroid is then bared by detaching and reflecting the cricothyroid and inferior constrictor muscles. The front of the thyroid should now be freed by the separation and reflection back to the superior cornu of the muscles and perichondrium, and the cornu freed by dividing its perichondrium and pushing it, along with the lateral part of the pharynx and adjacent loose areolar tissue, backward until the posterolateral border of the cricoid is reached. The outer two-thirds of the thyrohyoid membrane is then cautiously divided transversely at the junction of its upper and middle thirds, and when the underlying mucous membrane is reached it must be picked up and divided, upon which the superior portion of the epiglottis can be seized and drawn forward. This opens the anterior wall of the pharynx, and by traction on the epiglottis the larynx is so drawn forward that the knife can be placed on the posterior surface of the cricoid and by cutting downward the anterior wall of the esophagus will be opened. This opening into the esophagus should be limited to that portion covered by the cricoid, so as to avoid removal of too much of the anterior wall of the pharynx and esophagus. The larynx is thus completely separated, and the gap in the pharynx should be closed by means of sutures inserted close to the edges in order to prevent inversion. The suturing of the mucous membrane should be made water-tight by means of fine catgut sutures so as to form a Y-shaped stitched line. This is followed by a row of Lembert sutures which transfix the muscular and cellular coats of the esophagus and pharynx. A third layer unites the stumps of the pharyngeal constrictors, a fourth brings together the cut ends of the sternohyoid and thyrohyoid muscles, and finally the T-shaped skin incision is closed, leaving a three-cornered cavity above, which is packed with iodoform gauze. The cannula may be removed in 24 hours and nutriment given by the rectum for from 1 to 2 days, after which milk may be given by the mouth.

E. Fletcher Ingals,¹ before the Section on Laryngology and Otology of the American Medical Association, described the **method of laryngectomy** adopted by the late Christian Fenger in the last operation performed by him. A preliminary tracheotomy through the third, fourth, and fifth rings was performed 3 weeks before the laryngeal operation, and the resulting tracheobronchitis allowed to subside. A Hahn's cannula was inserted, through which chloroform was administered. The cutaneous incision was I-shaped, the upper transverse cut following the hyoid bone, the lower one crossing below the cricoid cartilage, and

¹ Amer. Med., June 21, 1902.

the vertical one being in the median line. The flaps thus outlined, and containing skin, superficial fascia, and prelaryngeal muscles, were held aside and a curved needle passed under the hyoid bone, which was pulled forward by a strong silk ligature. The larynx was then opened, the thyroid and cricoid cartilages being split vertically, and the thyrohyoid membrane severed from the hyoid bone. The patient was then placed in an extreme Trendelenburg position, so that posture would aid the cannula in preventing the entrance of blood into the trachea and saliva into the wound. Contrary to the usual practice, the removal of the larynx was begun by severing it from its upper attachments, for the reason that a better opportunity was afforded to care for the pharynx and esophagus because they could thus be brought into plainer view and more carefully separated from the larynx; it had the additional advantage of affording greater freedom of motion to the larynx and rendering it possible to so lift and twist it as to expose the lateral portions where the vessels lay. The superior and inferior laryngeal and superior thyroid arteries were divided between hemostatic forceps and tied. The larynx was then carefully dissected from the pharynx and esophagus, drawn forward, and removed at its attachment to the trachea. The opening into the pharynx and esophagus was sutured from above downward and the severed end of the trachea brought out of the wound and stitched to the skin at the point where the lower transverse and the median incision met. The skin-flaps were turned in and sutured, the Hahn cannula removed, and the old cannula replaced. Moist boric acid dressing was used.

Autoextirpation of the Larynx.—At a meeting of the Forensic Medicine Section of the 1901 Paris Congress, Szigeti¹ related a case of a woman aged 42, who went with a neighbor to the public baths. While waiting for admission the woman was suddenly missed by her friend, who, not succeeding in finding her, went to the former's rooms and found them closed. She knocked in vain, and after about 2 hours, learning that the woman had been seen to enter, informed the husband, who entered the room through a window. The woman was found to be still alive and lying in a pool of blood with her throat cut. Half an hour later a physician arrived, and when dressing the wound found that the larynx was missing. Search revealed it lying some feet away, and near it a table knife with which the deed had been done. As the hemorrhage had ceased, a few stitches were inserted and the patient sent to a hospital, where she died 8 or 9 hours after the infliction of the injury. The removed portion consisted of the entire larynx, a portion of the thyroid gland, the anterior wall of the pharynx, and the anterior upper part of the esophagus. There were numerous cuts on the larynx, but none of the skin of the neck had been removed with it. None of the contents of either carotid sheath were wounded. There seemed to be no doubt that the injury was self-inflicted, and a small cut on the last phalanx of the left middle finger led Szigeti to believe that the woman held the knife in the right hand, incised the skin, and

¹ Lancet, Sept. 21, 1901.

cut across the upper end of the larynx, while she tore it away with her left hand. The importance of this case from a medicolegal aspect is evident, as a charge of murder in such an instance might receive much support from the apparent impossibility of such an injury being self-inflicted.

Gelatin Solution in Postoperative Laryngeal Hemorrhage.—Goldschmidt¹ relates a case in which cureting for tuberculous laryngitis was followed by severe hemorrhages, which ceased for only about 10 minutes under applications and sprays of iron solutions. Four pieces of gelatin, each measuring about 10 sq. cm., were boiled in 100 cc. of water and a few drops of the resulting solution instilled into the larynx under guidance of the mirror. The hemorrhage ceased almost immediately, and did not recur.

A New Aseptic Throat Mirror.—A. T. Haight² describes an aseptic throat mirror made of polished German silver highly nickel-plated (Fig. 97). The handle is universal and the joint between the mirror and the handle is a spring ball-and-socket. The changing from one

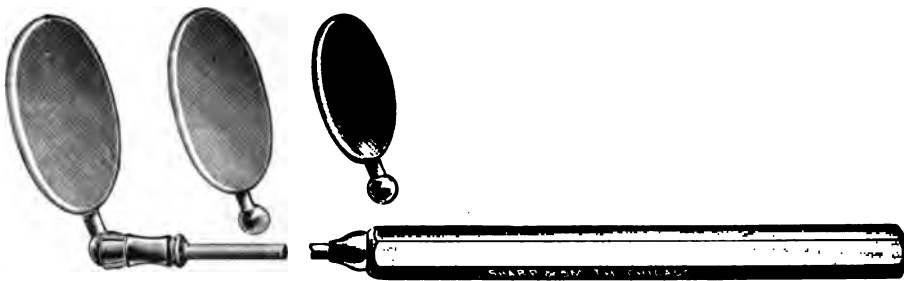


Fig. 97.—Haight's aseptic throat mirror (Jour. Am. Med. Assoc., May 3, 1902).

size to another is done at this point, and on account of the form of joint employed the mirrors are adjustable to any position or angle. They can, of course, be readily sterilized by carbolicizing or boiling, and will not be corroded by acids provided they are quickly cleansed after using. The fingers should be kept away from the surface and soft chamois skin should be used to polish the surface before warming. When it is about to be used, it should be adjusted to the desired angle, dipped into hot water for a moment and the water allowed to run off; it can then be dried and introduced into the throat.

The Use of the Electromagnet for the Extraction of Foreign Bodies from the Air-passages.—A. W. de Roaldes,³ before the American Laryngological Association, describes some experiments with the Haab magnet which he had made on a cadaver, with the object of determining the practicability of removing metallic foreign bodies from the air-passages. Among those experimented with were a roofing nail 1 inch long and 17 grains in weight and a steel button $\frac{3}{4}$ inch in diameter and

¹ Therap. der Gegenwart, Feb., 1902.

² Jour. Am. Med. Assoc., May 3, 1902.

³ Med. Rec., July 13, 1901.

15 grains in weight. Before inserting them into the cadaver he ascertained that the nail was attracted by the magnet at a distance of 9 inches and the button at 8, when placed in a glass tube lined with leather. These two structures were then placed in the trachea and bronchi through a tracheotomy incision, and were easily removed by the magnet held at the level of the wound. In one of his experiments the button was moved along from the bronchus upward and from the subglottic space downward to the tracheal incision by the application of the magnet to the overlying skin. For use in the living de Roaldes has had constructed several vertebrated metallic bougies which can be attached to the Haab magnet and act practically as extensions of its core. A commutator can be used so that the current can be interrupted and the foreign body thus be coaxed along by a succession of magnet pulsations rather than by steady traction. [This same principle has been applied by Collet, of Lyons, to the extraction of the intubation



Fig. 98.—Fowler's invisible respirator (*Jour. of Laryngol., Rhinol., and Otol.*, April, 1902).

tube. Instead of using the ordinary extubator of the O'Dwyer set, he uses a curved electromagnet, which is attached to a portable battery and inserted into the throat. The attraction exerted by the magnet draws the tube from its place and holds it until it is detached or the current turned off. This is eminently a practical suggestion, renders unlikely the slipping of the tube into the trachea or esophagus, and makes comparatively easy the most difficult of all the intubation manipulations.]

Fowler's Invisible Respirator (Fig. 98).—This instrument is described in the "*Journal of Laryngology, Rhinology, and Otology*," April, 1902; it consists of two closely perforated metallic plates encased in a light framework and of such curvature and size that it can be held in the mouth between the lips and teeth. It is thus practically invisible, and on account of its construction can be sterilized by boiling without danger of its construction being injured. Thin layers of medicated cotton or similar substances can be placed between the plates and the inspired air thus saturated with the desired drug.

DISEASES OF THE TRACHEA.

Hemorrhagic Tracheal Catarrh.—J. Tommasi¹ states that this disease is important in that it explains the absence of pulmonary symptoms in certain cases of hemoptysis, and also because a more unfavorable prognosis than is justifiable may be given by the physician on account of the uncertainty as to the source of the blood. The cause in one case was an acute tracheitis with hemoptysis resulting from influenza, while in the others the tracheitis was chronic and probably secondary to nasal obstruction and consequent disease of the nasopharynx. Rupture of small vessels in the relaxed and inflamed subglottic mucous membrane takes place very easily, especially on coughing, loud speaking, or sudden muscular efforts, due probably to the fact that at this point the pressure of the expired air is greatest. In none of the 5 cases reported by Tommasi was there any predisposition to pulmonary tuberculosis. All of them suffered from tickling in the throat and a sense of irritation along the cervical portion of the trachea. The cough was usually slight and was present for a longer or shorter period before the appearance of blood-spitting, which occurred at irregular intervals and in no case exceeded 70 grams. The diagnosis was made by laryngoscopic examination of the trachea and by the negative results of examination of the lungs and sputum. The tracheal appearances comprised excessive congestion and vascular dilation in the mucous membrane of the intercartilaginous spaces above the sixth ring, along with submucous extravasations of blood and clots on the tracheal wall. The treatment of the bleeding consisted in vocal and bodily rest, cold, liquid diet, ergotin, and ice. After the cessation of the hemorrhage astringent sprays were administered for the purpose of constricting the dilated vessels and improving the general tone of the mucous membrane. General directions comprised a change to seaside or mountain air, and the abstention from smoking and the use of strong alcoholic beverages.

Intratracheal Colloid Struma.—C. F. Theisen² reports a case of a woman of 32, who 7 years before examination had noticed a contraction of the muscles of the left side of the neck along with swelling of the glands of the same side. Shortly afterward she noticed slight difficulty in breathing, which had irregularly increased until at the present time it was quite alarming. Examination revealed a moderate-sized goiter, the left lobe and isthmus of the thyroid being particularly enlarged. There were marked inspiratory stridor and thrill. With the exception of somewhat prolonged expiratory murmur at the left apex the other organs were normal. Laryngoscopic examination showed a tumor of considerable size originating from the posterior and left walls of the trachea and almost completely filling its lumen. It was regular in outline, had a few vessels running over its surface, and was covered with normal-looking mucous membrane. The dyspnea became so severe that operation was demanded, and under many difficulties the tumor was removed by tracheotomy.

¹ Ann. di Laryngol., etc., Genoa, Nov., 1901.

² Am. Jour. Med. Sci., June, 1902.

It almost filled the trachea and was over 5 cm. long, extending downward along the posterior wall from the first tracheal ring. It was resilient and firmly attached by a broad base to the posterolateral aspect of the trachea. In spite of double pneumonia, attended several times by extreme collapse and blocking of the trachea below the tube, the patient recovered. The pathologic diagnosis of the tumor was "colloid struma, originating in thyroid tissue situated beneath the submucosa of the trachea." The histories of 9 other cases of this condition are given. These growths should not be called accessory thyroid tumors. They originate after birth by penetration from without of the thyroid gland tissue between the cricoid and thyroid cartilages, between the cricoid and trachea, or between the upper tracheal rings and through the interstitial tracheal membrane. The growth is a direct extension of an enlarged thyroid gland. This theory of Paltauf's is supported by the investigations of Gruber, who found in many Russians and Bohemians an accessory or extra lobule extending downward from the posterior inferior margin of the lateral lobes and lying very close to the trachea; these lobules may be found also in the cricothyroid space. Analysis of the 10 reported cases shows the following points: The location of the tumor in 9 was characteristic, as they were all situated in the lower part of the larynx and upper part of the trachea and attached to the lateral and posterior walls. In the tenth case the seat of attachment was the anterior wall. These tumors, therefore, should not be called accessory thyroid tumors, because they are really outgrowths from the thyroid, as is proved from the fact that in the majority of the cases the thyroid is adherent to the trachea, and in one case microscopic examination revealed infiltration of the interstitial membrane with thyroid follicles. With one exception they were observed in early life, from the fifteenth to the thirty-third year, the exception occurring in the fortieth year. A moderate-sized goiter was present in 8 of the 10. They occurred in both sexes, 3 in males and 7 in girls and young women. In one case, the author's, the patient was pregnant, which condition probably influenced the development and increase in size of both the intratracheal and extratracheal struma, since the dyspnea became much worse during pregnancy. The prognosis is usually favorable, because when complete removal is effected the tumor appears to have no tendency toward recurrence. The treatment indicated, when the growth is large enough to interfere with respiration, is prompt laryngotracheotomy, as these tumors have a peculiar capacity for suddenly increasing in size. The internal administration of thyroid gland might be of value.

MISCELLANEOUS.

The Effect of the So-called Catarrhal Diseases of the Nose and Throat upon the General Health.—C. M. Cobb¹ draws the following conclusions: (1) Diseases of the nose and throat affect the general health through obstructed nasal respiration, or by extension of the diseases of

¹ Jour. Am. Med. Assoc., July 27, 1901.

bacterial origin. (2) The diseases of bacterial origin affect the general health by extension upon the surface membrane, by the migration of bacteria to surrounding tissues or to distant parts of the body, by swallowing of the discharge, or by the absorption of toxins. (3) The migration of bacteria takes place through the lymph-current, or through the blood. (4) Septic infection originating from disease of the nose and throat does not differ materially from infections from other organs. (5) Much of the indigestion from which these patients suffer is caused or made worse by the swallowing of the secretion. (6) A condition of chronic sepsis may be caused by a purulent collection in the nasal chambers or accessory sinuses.

Local Anesthesia in the Ear, Nose, and Throat.—Albert A. Gray¹ describes some improvements in his method of producing local anesthesia by the use of a solution of cocain in anilin oil and rectified spirit. Two cases of intoxication are reported, one of which was evidently produced by the cocain and shortly disappeared. The second case was that of a child of 6 in whom the external auditory meatus was filled with the solution. In the course of an hour the patient's lips became blue and slight nausea developed, but recovery occurred in a few hours. The blueness of the lips is due to the transformation of oxyhemoglobin into methemoglobin and passes off in a few hours. It can be prevented by limiting the dose to 20 minims as a maximum for adults, with a corresponding limitation in children.

The Action of Hot Air on the Mucous Membrane of the Upper Air-passages.—Iermoyez and Mahu² report that further trial has confirmed their belief in the value of hot air in the treatment of the following conditions: Spasmodic rhinitis; congestive rhinitis; hypertrophic rhinitis; hydropnea, with nasal obstruction, rhinorrhea, sneezing, asthma, nasopharyngeal catarrh; otalgias, tubal and tubotympanal catarrhs, with deafness, vertigo, etc.

The Chemistry of the Saliva.—D. Braden Kyle³ emphasizes the importance of studying the chemic changes occurring in the various secretions and tissues. It is well known that study of the products of those secreting organs which throw off waste material conveys to us a fair idea of the processes occurring within the body, and these products are altered and controlled by those compounds already within the body. As the bodily conditions vary, it must follow that the chemic properties in the various glands must likewise vary, and the product of such variation must correspond to similar conditions found when dealing with a known compound in the laboratory. The body, in fact, is largely a chemic laboratory with a certain amount of material on hand and with other ingredients added daily through the respiratory and alimentary tracts, and any perversion of its normal chemistry may bring about changes and produce chemic compounds which may be either harmless or deleterious. This is the only basis on which can be explained the various diatheses and the precipitation of certain materials in the somatic tissues. Cell nutrition is

¹ *Lancet*, Mar 9, 1901.

² *Ann. des Mal. de l'Oreille*, etc., July, 1901.

³ *Amer. Med.*, July 12, 1902.

dependent upon the chemistry of its supply and is illustrated in those diseases which are associated with infection or temperature rise, the effect depending on the amount of infection or the extent of the change produced by the increase of temperature. Conditions, of course, vary even in normal individuals; yet it is probable that a certain general standard can be arrived at and which would be sufficiently accurate to allow of chemic and clinical deductions. It is well known that certain drugs have a selective action on certain tissues and organs and that the normal chemistry of the body controls the secretion from the various organs, the only difference between these being that one is introduced into and the other manufactured within the body. Kyle¹ reported a number of cases of simple hyperplasia of the thyroid gland which were either cured or improved by the exhibition of boric acid. The reasoning was that under certain conditions due to perverted chemic reaction there was precipitated a material, which, circulating through the blood, had a selective action on the thyroid gland, on which it acted as an irritant and whose blood-supply it stimulated. While the treatment was empiric, it is probable that the administered drug altered the chemistry of the irritating substance, either rendering it inert or forming a new nonirritating compound. As a result of study of the saliva Kyle has become convinced that from it can be determined, to a great extent, any variation in the chemistry of the body, since the various glands receive from the blood the supply from which they elaborate their products, and if this could be analyzed a good index to the general condition of the individual could be obtained. Three cases are reported in which an offensive breath was found to be due to a pathologic condition of the saliva, and chemic analysis demonstrated the presence of sulfocyanids, which with the ammonium salts caused rapid decomposition. Another case was a peculiar form of leukoplakia buccalis in which the author believes that the change in the surface epithelium was due to some peculiar compound derived from the saliva. Four other cases were of peculiar ulceration of the tongue, lips, and buccal mucous membrane, and resembled very much aphthous ulcers. These cases had been treated internally and locally with no benefit. Examination of the saliva showed it to be strongly acid, demonstrating the lack of proper oxidation. Treatment directed toward the changing of the salivary reaction effected a cure in 3 of the cases, while the fourth is still under observation. Kyle's studies have been very much in the same line as those of Michaels, as described in the latter's paper before the International Dental Congress, August 9, 1900. They comprised the study of the saliva from normal, from hypoacid, and from hyperacid individuals. Michaels in addition investigated the function of the biliary principles and their presence or absence in the blood-plasma and saliva, and demonstrated that many of the substances found in the latter could be traced to a hepatic origin. Michaels also showed that modifications of the saliva were in direct relation with the constitutional diatheses. The ammoniacal salts and sulfocyanids are present in healthy saliva in very small quantities and in equal proportion; in the hypoacid condition the ammonia

¹ Amer. Med., Feb. 8, 1902.

preponderates and tends rapidly to decomposition; in the hyperacid the cyanid is in excess and the tendency to decomposition is not so great as in the haemacid.

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¹ Ann. des Mal. de l'Oreille, etc., May, 1901.
² Bull. de la Soc. d'Otol. et Rhinol., 1901

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¹ Amer. Med., Feb. 8, 1902.

preponderates and tends rapidly to decomposition; in the hyperacid the cyanid is in excess and the tendency to decomposition is not so great as in the hypoacid.

THE EAR.

Prominence of the Auricle.—T. R. Pooley,¹ before the American Laryngologic, Rhinologic, and Otologic Society, reported a case in which operation for this condition was performed after the method of Ely. A cutaneous incision was made along the entire length of the furrow formed by the junction of the auricle with the side of the head. This was joined at each end by another curved incision and the intervening skin dissected off. A piece of cartilage, elliptic in shape and measuring an eighth by a third of an inch, was then removed. The wound was closed by 7 interrupted silk sutures, 4 of which passed through the skin only, while the other 3 included both skin and cartilage.

Ringworm in the External Auditory Meatus.—Bar² reports 2 cases of ringworm in the meatus and concludes: (1) Most of the dermatomycoses can attack the meatus and cause a parasitic otitis, important to recognize and difficult to cure. (2) The trichophyton of Malmsten is one capable of causing these inflammations. (3) Trichophytic otites are acute, subacute, or chronic, characterized by a dermatitis which can be extremely violent, with an eruption of vesicles and pustules, or simply erythematous and squamous. (4) Prognosis is good in acute cases and variable as to the integrity of the ear and hearing in cases which progress slowly. (5) Diagnosis must be made principally from furuncle, otomycosis, impetiginous and squamous eczema, various acnes, syphilitic erythemas and roscolas, and various syphilides. Microscopic examination can alone decide the case. (6) Treatment runs on the general lines which govern those of dermatomycoses, and in the direction which takes account of the etiology, according to the region in which the malady occurs. Among the medicaments and parasitocides which one can employ in such cases, mercuric chlorid lotions (1 : 1000) and naphtholene in vaselin (1 : 10) are the best.

Pneumatocele of the Auditory Canal.—Lannois³ reported a case of this exceedingly rare disease before the French Otologic and Rhinologic Society. The patient was a cornet player and one day used his instrument continuously for several hours; the following night he was suddenly attacked with deafness in one ear. Six days later his ear was examined and a soft mass was found filling the external auditory meatus; upon puncturing with a needle the mass collapsed. After 7 similar attacks a final cure was secured by incision of the pneumatocele and the injection of alcohol to promote adhesive inflammation and obliteration of the air-cavity. Lannois' theory is that the formation of the tumor was due to a dehiscence of the petrosquamous suture, as a result of which some of the mastoid cells were covered only by periosteum. Under the pressure of

¹ Jour. of Laryngol., Rhinol., and Otol., Sept., 1901.

² Ann. des Mal. de l'Oreille, etc., May, 1901.

³ Bull. de la Soc. d'Otol. et Rhinol., 1901

air incident to playing the cornet this periosteal wall gave way and formed the air-tumor which made its appearance in the external auditory canal.

Cerumen Removed by Sulfuric Ether.—E. L. Meierhof¹ states that the instillation of sulfuric ether into the external meatus in a few seconds partly dissolves the plug and loosens its attachment to the canal so that its removal is readily effected by means of the syringe. [Hydrogen dioxid is equally good and much safer.]

An Aural Masseur.—In the *Journal of Laryngology, Rhinology, and Otolaryngology*, January, 1902, is described and figured a double-cylinder masseur, to which can be attached a Siegle otoscope. The length of the strokes can be regulated by an adjustable piston and the apparatus can be run either by compressed air, by a small battery, or by hand.

A New Device for Syringing the Ear.—L. G. Langstaff² describes a new apparatus for syringing the ear. It consists of a cylindric metal ear-

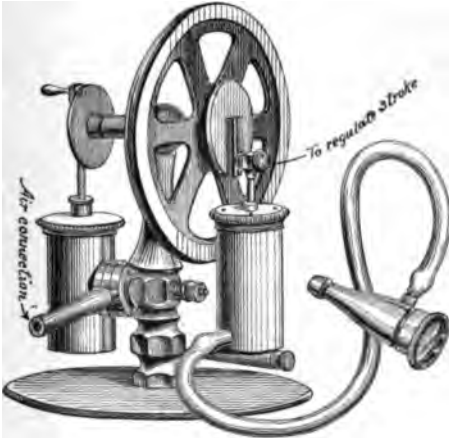


Fig. 99.—Aural masseur (*Jour. of Laryngol., Rhinol., and Otol.*, Jan., 1902).

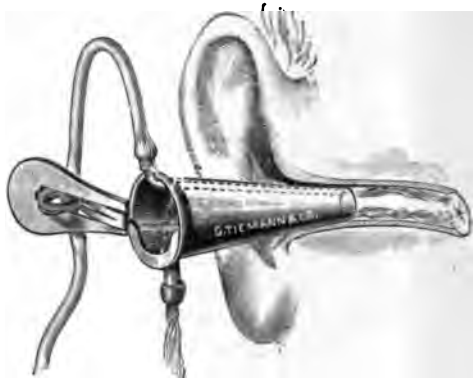


Fig. 100.—Langstaff's device for syringing the ear.

speculum of medium size, along whose upper wall runs a small channel which terminates in a small slit-like opening at its inner end. At the outer end is a nipple for the attachment of a rubber tube carrying the fluid. The solution returns through the speculum, which has a small dam at the lower part of its upper margin, where another small tube is located through which the returning fluid can be carried away. To the handle of the instrument is attached a spring cut-off through which the inflow tube runs; pressure by the thumb on the spring allows the fluid to run, and removal of the pressure stops it.

Suppurative Parotitis.—F. R. Packard³ reports 2 cases in which the pus discharged through the fissure of Santorini into the external auditory meatus. It is quite probable that a number of such cases occur in general

¹ N. Y. Med. Jour., Aug. 24, 1901.

² N. Y. Med. Jour., July 6, 1901.

³ Jour. Am. Med. Assoc., Aug. 17, 1901.

practice and that the true source of the pus is not suspected, it being attributed to a suppurative condition of the middle ear.

Acquired Deaf-mutism.—M. Collier¹ reports the case of a girl of 9, who up to the age of 2 had been normal, when she contracted typhoid fever, from which she made a good recovery. A year later she passed through a virulent attack of measles and was unconscious for 2 weeks, apparently without any involvement of the middle ear. She then became increasingly deaf and unable to use words freely, until her vocabulary narrowed down to 3 or 4 sounds. In all other respects the child was perfectly normal and the family history gave no indication of deaf-mutism or ear-disease. On examination both ears were found to contain old masses of hard and dry cerumen, which were removed with considerable difficulty. After the removal of the cerumen, inspection of the membranes showed that they were somewhat retracted and opaque; there was enlargement of the inferior turbinals, but the pharynx was free. The treatment used comprised a nasal wash and inflation by means of the Politzer douche. The child rapidly recovered her hearing after the removal of the wax, and along with this improvement there was marked advance in her ability to speak.

Amberg's Modification of Leiter's Apparatus for the Ear.—E. Amberg² describes a Leiter's apparatus modified by

him. It is made of inflexible material, with an opening through which the ear can pass, and around which the water circulates through a hollow chamber. The ordinary long lead tubing is avoided, and in order to insure keeping the apparatus full of water the inflow tube has about twice the diameter of the outflow. The apparatus is slightly bent so as to adapt itself to the rounded surface of the head and is made in different sizes to accommodate ears of various sizes.

Relation of the Facial Nerve to the Tympanum, Especially in Tympanic Exenteration.—B. A. Randall³ considers the relations of the facial nerve to the entire series of air-spaces intervening between the eustachian tube and the mastoid cells. The oval window is usually easy to locate and its upper margin is formed by the protruding facial canal, which passes forward a few millimeters until the geniculate ganglion is reached. The nerve then passes deeply into the petrous bone. Behind the oval window it curves downward to pass about 3 mm. behind the middle of the posterior margin of the annulus, then descending vertically



Fig. 1.—Unfinished.

Fig. 2.

Fig. 101.—Amberg's modification of Leiter's apparatus for the ear.

¹ Med. Press and Circ., Jan. 15, 1902.

² Jour. Am. Med. Assoc., Aug. 3, 1901.

³ The Laryngoscope, June, 1902.

to its point of exit at the stylomastoid foramen. When approaching it through the mastoid a useful anatomic guide is the bony protuberance on the inner wall of the antrum which marks the external semicircular canal and the facial canal. This protrusion can usually be recognized if the field of operation has been well exposed and thoroughly cleansed; and if it is remembered that from this point the course of the nerve is exactly vertical, it should not be difficult to locate its position during any stage of the operation.

Treatment of Otorrhea.—D. W. Aitken¹ describes a method of forcing solutions into the recesses of the tympanic cavity. The necessary apparatus comprises a probe, preferably one with two spiral teeth at the end, some antiseptic solution, and absorbent cotton. The solution is poured into the ear and then a pledget of cotton sufficiently large to fill the meatus is fastened to the end of the probe, this is introduced into the ear and practically forms a suction syringe. The pledget of cotton is then gently pushed in and withdrawn, this process being repeated as often as may be deemed necessary. The fluid reaches the attic and mastoid recesses, and Aitken states that the amount of discharge and debris which is brought out is surprising, even after thorough syringing and swabbing have been performed. After this has been repeated several times, the head being well turned over to permit emptying of the meatus, the solution will come out clear, and the desired medicament can be applied to the cleansed mucous membrane. Those recommended are chinisol, iodoform, or amyloform in alcohol, which should be absolute; it is usually painless, and when smarting does occur it is but momentary. It acts promptly upon the polypoid growth, it is a satisfactory antiseptic, and after evaporation a dry surface is left. While the best results have been obtained in old-standing cases in which the mastoid has become infected, it is also quite prompt in cases of acute otorrhea.

Bacteriology of Otitis Media.—J. Funke,² as the result of the laboratory investigation of 36 cases, comes to the following conclusions: (1) There is no specific organism of otitis media. (2) Acute otitis media is not invariably monomicrobic, as is commonly held. The pathogenic organism present may be alone, but with it are frequently found a varying number of associated bacteria which may or may not be influential in determining the outcome of the case. (3) The organisms commonly found, in the order of frequency, are: The pneumococcus, streptococcus, pyogenic staphylococci (albus and aureus), and bacillus of Friedländer. He is strongly inclined toward the belief in a definite grippal otitis, primarily due to the influenza bacillus, which, however, becomes quickly associated with, or replaced by, other organisms. (4) Bacillus diphtheriae is more commonly present in otorrhea than is usually believed; it may be (a) the initial infecting agent, (b) it may enter with the streptococcus or pneumococcus, or (c) it may be a secondary infection carried to the already infected ear by the fingers of the patient or otherwise, as held by Baginsky. (5) It is reasonable to believe that it persists for a varying period of time in the discharges, and may constitute a center of

¹ The Lancet, April 20, 1901.

² Amer. Med., Nov. 2, 1901

danger just as has been thoroughly established concerning its prolonged residence in the nasal cavities, pharynx, etc. Its frequent association with *Bacillus pseudodiphtheriæ* has here the same significance as elsewhere, a factor not as yet fully determined. (6) The streptococcal infections are more grave and persist longer than pure pneumococcal infections, but both are usually supplanted by the staphylococci sooner or later. (7) There is a true pneumobacillary otitis, usually acute and quickly converted into a mixed infection. The gravity of the process depends almost exclusively upon the character of the mixed or secondary infection. (8) Chronic suppurative otitis media is practically always a sequence of the acute. (9) Like the acute, it possesses no specific organism. (10) Unlike the acute, it is practically always polymicrobial. (11) Its polymicrobial character may be evinced in any of three ways: (a) A mixed infection of pathogenic organisms; (b) one or more recognized pathogenic organisms (usually pyogenic staphylococci) with one or more bacteria usually regarded as saprophytes; (c) the usual pyogenic and pathogenic bacteria are absent, and the discharges are maintained through the activity of organisms that commonly lead a saprophytic existence. (12) While anaerobic organisms may play an important part in the pathogenesis of chronic suppurative otitis media, their almost constant presence, as maintained by Rist, was not established. (13) The fetor met in the cases reported can be explained by the presence of *Bacillus pyogenes fœtidus* without anaerobic organisms. (14) All clinical and collated bacteriologic data indicate that otitic inflammations present different bacteriologic findings in different localities. According to Moos, during the influenza epidemic of 1890 the otitic complications were due to the pneumococcus in Vienna (Weichselbaum), and to the streptococcus in Strassburg, in Griefswald, and in Bonn (Ribbert). (15) Reports gathered from literature establish the existence of a primary tuberculous otitis, but all observers are of one mind as to the almost utter impossibility of routine demonstration of the bacillus in the discharge. (16) For the demonstration of the tubercle bacillus in suspected cases he recommends the examination of tissue obtained by the curet.

Otitis Media Neonatorum.—O. Joachim¹ gives the results obtained by numerous investigators as to the frequency with which the ears of young children are diseased. The extreme frequency with which pathologic changes are found in the ear of the very young is explained by the following anatomic and physiologic peculiarities of the ear during early life: (1) The eustachian tube is very short and is actually wider than in the adult. [When one considers the ease and frequency with which children vomit, it can be readily understood with what facility the vomited matter, particularly if the size of the nasopharynx is diminished by the presence of adenoids, would enter the eustachian tube.] (2) By the eighth month of fetal life the tympanic cavity is well formed, but contains a cushion of mucous membrane; should breathing occur before delivery, amniotic fluid may enter the middle ear. When breathing occurs after

¹ New Orleans M. and S. Jour., Dec., 1901.

birth, the cavity becomes distended with air and the natural process of resorption of the hyperemic mucosa takes place. (3) The detritus of this process may remain in the ear for a longer or shorter time. (4) The secretory organs of the upper air-passages are extremely active and well developed. (5) The recumbent position is favorable to aspiration and to the infection of a soil which contains considerable gelatinous tissue and is eminently suited for the development of microorganisms.

Nonsuppurative Catarrhal Otitis Media as a Factor in the Etiology of Facial Paralysis.—H. O. Reik¹ emphasizes the fact that dehiscence of the fallopian canal in the tympanum is a very frequent condition. There is present also a small foramen in the wall of the canal just above the oval window for the passage of a branch of the stylomastoid artery to the stapes. For these reasons it is very readily possible for an exudate in the tympanic cavity to exert direct pressure on the exposed nerve or to travel by means of direct extension through this little foramen to the nerve-sheath. The practical lesson to be drawn from this is that the ear should be examined in all cases of facial paralysis, and if any evidence of pressure is present in the middle ear, paracentesis should at once be performed.

Superheated Air in the Therapeutics of Chronic Catarrhal Otitis Media.—G. W. Hopkins² uses the following method: The ear is prepared for the treatment by being thoroughly cleansed with alcohol for several days before the treatment begins. The meatus is packed with narrow strips of dry gauze and the ear covered by a large pad of the same material. A canvas-sleeve hot-air conductor is then applied to the side of the head, covering in the ear, and a current of hot air at a temperature of 400° F. is sent into the canal. The only discomfort produced by the high temperature is an occasional headache, which is promptly relieved by codein. After the hot air has been turned off the eustachian tube is treated with a warm stimulating vapor from a nebulizer, and vibratory massage employed. Treatment is continued on alternate days for several weeks. The packing absorbs moisture, prevents burning of the skin, and renders the application of the high temperature easy and comfortable. Contraindications for this method of treatment are arteriosclerosis, serous effusion into the tympanic cavity, and perforations.

Otitis Media of Sucklings.—Siegfried Weiss³ reports the examination of the ears of 28 children who had died of such conditions as diarrhea, bronchopneumonia, etc. The tympanic disease was found to be essentially benign, affecting only the superficial layers of the mucous membranes. Infection occurred in the large majority of instances through the tube, very rarely through the blood. The frequency in children is probably due to the presence of embryonal tissue in the mucosa, which is much less resistant than the tympanic mucosa of adults. The organisms present were found in the following order of frequency: *Diplococcus pneumoniae*, *Streptococcus pyogenes*, *Staphylococcus pyogenes aureus*, and *S. pyogenes albus*.

¹ Johns Hopkins Hosp. Bull., April, 1902.

² Med. Rec., June 1, 1901.

³ Proc. of the Austrian Otolog. Soc., Feb. 26, 1900.

Otitis Media and Pneumonia.—T. S. Wilson¹ calls attention to the frequent concurrence of these two diseases, and states that otitis media and pneumonia may be related to each other as follows: (1) It may be accidental, as for example when a child with otorrhea develops pneumonia, and the one condition may have little or no influence on the other. (2) The otitis may be secondary to the pneumonia, and this relationship is unquestionably the most common. The pneumococcus enters the middle ear through the eustachian tube and gives rise to a suppurating inflammation. The practical lesson to be drawn from this is that during the course of pneumonia, and particularly in children, a careful toilet of the mouth and pharynx should be observed. (3) The otitis media may be the original manifestation of the pneumococcus infection, the pneumonia appearing subsequently. (4) An ordinary attack of otitis media may give rise to general pyemia accompanied by pneumonia of the ordinary septic type.

Otitis Media Mucosa.—H. A. Alderton² describes the symptoms and otoscopic appearances of this disease. The treatment recommended is iodid of potassium in increasing doses and incision and evacuation of the middle ear. Sometimes, on account of the viscosity of the fluid, quite forcible politizerization is necessary in order to accomplish complete emptying of the tympanic cavity. Along with these measures there should be used proper treatment of the nasopharynx and scrupulous asepsis of the external auditory meatus. Should the exudate persist in re-forming, a solution of silver nitrate, $\frac{1}{2}$ to 1 grain to the ounce (0.03 to 0.6–30.0), should be injected into the tympanic cavity, both through the eustachian tube and through the incision in the membrane.

Middle Ear Sclerosis.—M. Collier³ states that a very large percentage of cases of sclerosis or adhesive disease of the middle ear are concomitants and the direct result of ordinary nasal catarrh, that they arise simply from mechanical obstruction to the eustachian tube, and that early recognition and removal of the eustachian obstruction, aided by daily manipulations of the tympanic membrane, often result in a satisfactory and permanent restoration of hearing. Collier lays stress on the fact that the lining membrane of the tubotympanic cavity partakes of the character of and virtually is a periosteum. From the embryologic standpoint the eustachian tube and tympanic cavity are entirely distinct from the internal ear, the former being an evagination from the pharynx and the latter an invagination of the surface ectoderm. In the associated conditions of a chronic coryza [Collier deprecates the use of the words "hypertrophic" and "hyperplastic" on the theory that the latter is simply an effect of the former] with partial obstruction of the nasal respiration there is present every factor essential to the production of sclerosis of the middle ear. If free aeration of the middle ear is prevented, there would be partial absorption of the contents of the cavity; the tympanic membrane would retract on account of the unequal pressure and the lessening of the contained volume of the cavity; the vessels of the tympanic mucosa

¹ Birmingham. Med. Rev., July, 1901.

² Med. News. Sept. 21, 1901.

³ Jour. Laryngol., Rhinol., and Otol., Oct., 1901.

become dilated on account of the decreased tympanic pressure, and as a result there is swelling of the membrane and possibly effusion into it or into the tympanic cavity. Collier thus explains the hypertrophied condition of the tympanic mucosa. The tympanic membrane becomes permanently thickened and the whole tympanic mucosa thickened; there may be deposits of calcareous matter, particularly should the patient be of the lithemic type.

Direct Medication of the Eustachian Tube.—W. F. Clevenger¹ describes an instrument by means of which medicinal solutions can be instilled directly into the middle ear. It is made with a graduated scale at its external end and is intended to be used through the eustachian catheter. It is constructed of silver, is about 1 mm. in diameter, and can be readily passed through the ordinary eustachian catheter. The outer end is so constructed that it can be attached to an ordinary hypodermic syringe and, being composed of silver, it is readily sterilizable.

Tympanic Vertigo Due to Obstruction Within the Eustachian Tube.—W. P. Brandegee² states that tympanic vertigo is really a disease of the internal ear, although its cause is a narrowing of the eustachian

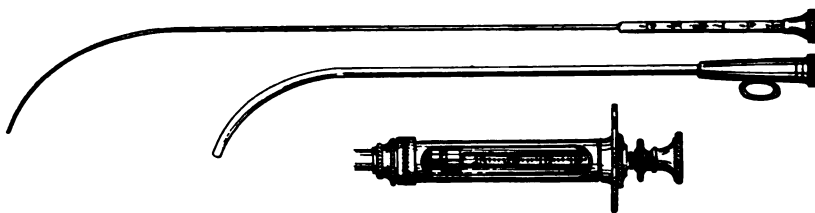


Fig. 102.—Clevenger's instrument for direct medication of eustachian tube (N. Y. Med. Jour., June 7, 1902).

tube, which is therefore removable. As the best means of restoring the tube to its patent condition he prefers Duel's method of electrolysis. Dundas Grant, in reviewing this article, states that he has found dilation of the tube by means of the Weber-Liel intratympanic catheter most efficacious.

Stricture of the Eustachian Tube Treated by the Electric (Duel's) Bougie.—T. J. Harris,³ before the American Laryngologic, Rhinologic, and Otologic Society, read a paper on this subject based on an experience of 33 cases. The bougie was introduced through a silver catheter wound with thin rubber, and a current of not more than 3 milli-ampères was used. The strength of the current was not increased on the appearance of bubbling, was not continued for more than 5 minutes, and was not followed by politzerization. Of the cases, 24 suffered from chronic tinnitus, and of these 1 was cured, 13 improved, and 12 unimproved. In 13 there was difficulty of hearing, and of these 12 were improved. Of the 24 cases suffering from tinnitus, only 2 were permanently cured. In every case but 1 the bougie was successfully passed through the stricture.

¹ N. Y. Med. Jour., June 7, 1902.

² Archives of Otolaryngology, vol. xxx, No. 3.

³ Jour. of Laryngol., Rhinol., and Otol., Sept., 1901.

Suppuration of the middle ear followed in 3 cases, in spite of aseptic precautions [which at the best must be ineffectual]. In one case the electrolytic treatment caused sudden and severe otalgia, followed in a few days by suppuration of the ear, which extended to the mastoid. Harris concludes that the electric current, even when properly used, is capable of causing adhesions in the tube; that the effect of the current in relaxing the stricture is not permanent; that it is questionable if these strictures are really fibrous; and that this method should be used after and not before other methods. [It would seem that this form of treatment must necessarily destroy the eustachian mucosa and replace the columnar ciliated epithelium with scar-tissue and thus predispose toward poor drainage of the middle ear and the accumulation of material in the tube.]

Some Details of Eustachian Catheterization.—Dundas Grant¹ gives some thoroughly practical points in overcoming some of the difficulties incident to passing the eustachian catheter. Before attempting to pass the catheter a preliminary rhinoscopic examination should always be made, and the application of a weak solution of cocain facilitates the operation by diminishing both sensitiveness and vascular turgescence. [The spraying or painting of the inferior meatus with some bland oil will lubricate the mucous membrane and aid the catheter in slipping by the obstructions which have been more or less reduced by previous cocainization.] In some cases the procedure is facilitated by using a nasal speculum and introducing the catheter under full illumination. If the obstruction be an oblique ascending ridge on the septum, the catheter could be introduced with its beak beneath the ridge and pointing toward the septum; when it has been pushed back as far as possible, the tip should then be rotated downward and outward beneath the inferior turbinal, then upward, and finally upward and outward into the vault of the inferior meatus. To accomplish the latter part of this procedure it is sometimes necessary to withdraw the catheter a short distance, after which it is pushed steadily backward until it enters the nasopharynx. In some instances, where the septal ridge diminishes rapidly toward its posterior end, the outward rotation of the beak of the catheter can be dispensed with and the instrument pushed backward in the same position in which it started. This procedure is greatly facilitated if the tip of the nose be forcibly raised. [Eustachian catheterization will be exceedingly difficult and sometimes impossible unless this plan be always adopted.] If the inferior turbinal is very large and the spur on the septum comparatively small, it is sometimes possible to pass the catheter above the turbinal until its tip reaches the nasopharynx, when a little downward pressure will force the stem of the catheter between the turbinal and the septal ridge to the floor of the nose. [This procedure is particularly feasible when a small-caliber catheter is used or when the nasopharynx is narrow and consequently the curve at the tip of the catheter forms the arc of a comparatively large circle.] When the projection on the septum extends so far outward in the inferior meatus as to nearly occlude the nostril, the nasal speculum cannot be used, because the tip of the nose should be forcibly pressed toward the

¹ Jour. Laryngol. Rhinol., and Otol., Sept., 1901.

opposite side; the tip of the catheter is then passed under the projection on the septum and the stem is directed toward the opposite side of the face. This will sometimes allow the catheter to be pushed in until its angle reaches the middle of the inferior meatus, which is considerably wider than the anterior part; by gently attempting to rotate the instrument it will then be possible to determine whether the tip should be turned upward or downward so as to be passed back into the nasopharynx. In some cases there is found a projection from the septum at the junction of its middle and posterior third, presenting a somewhat arched shape. To get past this obstruction the catheter must be introduced with its tip pointing upward, and to allow the maintenance of this position until the catheter has passed the obstruction the tip of the nose must be tilted well upward and toward the opposite side. [It would seem better to catheterize through the mouth by way of the nasopharynx and avoid all nasal obstruction, since the catheter can be passed directly into the eustachian tube.]

Hemorrhage into the Labyrinth.—M. G. Dadin¹ reports one of these rare cases, of only 27 of which could the author find records in literature. The attack was sudden and the symptoms were as follows: complete deafness, tinnitus, headache, and dizziness. Examination by means of inspection and hearing tests having excluded disease of the external and middle ear, the diagnosis of labyrinthine hemorrhage was arrived at by exclusion. In a few months the acute symptoms somewhat subsided, but the disease remained incurable. Dadin believes that the disease was due to congestion, which might have arisen from the patient having to stand near a hot stove for several hours a day or from an attack of la grippe. [The same condition has been known to follow mumps, under which circumstances it might arise either from the rupture of an over-distended blood-vessel dependent upon the congestion of the parotid gland, or as a result of the migration of the specific cause of the parotitis directly to the internal ear.]

Bilateral Necrosis of the Labyrinth with Bilateral Facial and Auditory Paralysis.—J. Herzfeld² reports an exceedingly rare condition following scarlatina in a child of 9½ years. During the course of the fever the patient had nephritis, with swelling of the abdomen and feet, early inflammation of the throat, followed by pain in both ears and swelling of the mastoid process; at the same time there developed deafness and loss of control of the facial muscles. After a few days there appeared a fetid discharge from the ears, followed by an improvement of the general condition. The pain in and behind the ears disappeared, also the swelling, though the deafness and complete facial paralysis remained the same. Patient could protrude the tongue in a straight line; the soft palate normal in function and the uvula in a median position; the pupils reacted normally; there was no ataxia, and, while the mind seemed clear, the speech was indistinct. Radical operation was done on both sides, disclosing bilateral necrosis of the labyrinth.

Cholesteatoma of the Middle Ear Causing Somnolence and Loss

¹ Meditsinskoe Obozrenia, Feb., 1902.

² Berl. klin. Woch., Sept. 2, 1901.

of Memory.—F. R. Packard¹ reports the case of a mechanic, aged 23, who for over 12 years had had an intermittent foul-smelling discharge from the left ear. For the past year the patient had noticed that his memory was failing and that he would have attacks of intense somnolence alternating with occasional headaches. His memory became so poor that it failed him even as regards the simplest things, such as the names of people and work plan for the day, and in spite of efforts at concentration he was unable to remedy the defect. After cleansing the external canal examination revealed almost the entire absence of the tympanic membrane along with a granulation mass covering the upper part of the exposed middle ear. There was also marked bulging of the posterior superior wall of the external meatus. On opening the mastoid there was found a large quantity of dead bone in immediate proximity to the middle ear, along with large masses of cholesteatoma in the interior of the mastoid. Recovery was uninterrupted, and 5 months after the operation there was no return of somnolence or headache, his memory was better, and his mentality brighter. In view of Burnett's statement that these states of somnolence and mental hebetude can be divided into two classes, those in which the suppuration extends to the cerebral surface and those in which the cerebral symptoms are due to pressure of the stapes, this case is interesting. Packard explains the cerebral symptoms on the basis of a meningeal congestion, with possibly a slight recurrent meningitis. W. G. B. Harland² reports the case of a boy of 13, in whom somnolence reached such an abnormal extent that he would go to sleep whenever his attention was not aroused. This condition had existed for a month and was unassociated with vertigo, tinnitus, nausea, or headache. Examination revealed a small mass of cerumen impacted in the left ear, which was easily removed by syringing, leaving behind it a few drops of fetid pus. The tympanic membrane was macerated and the posterior inferior quadrant revealed a large perforation. The somnolence disappeared within 24 hours after the removal of the wax plug.

Certain Peculiarities of the Ear Diseases of Children.—B. Baginsky³ points out some anatomic differences between the temporal bone in children and in adults, with their relation to diseases of the ear. The mastoid process is developed only partially and irregularly, and the antrum, while developed at birth, is bordered by thin bony walls, and the mucous membrane of the middle ear still shows remains of the embryonic state. He mentions a peculiar condition, "otitis media neonatorum," which is found in a large percentage of the newborn, though rarely presenting symptoms. He speaks of the aural complications of the exanthems, and also observes that the middle-ear inflammations occur most frequently in association with hypertrophy of the pharyngeal tonsils. The infection of the mastoid process he believes to be produced wholly through the circulation.

Ragged Opening in the Dura Closed by an Epithelial Graft.—C. A. Ballance⁴ reports a case of complete mastoid operation in which

¹ Med. News, Mar. 8, 1902.

² Phila. Med. Jour., Mar. 29, 1902.

³ Berl. klin. Woch., Feb. 10, 1902. ⁴ Jour. Laryngol., Rhinol., and Otol., Jan., 1902.

the roof of the antrum and attic had disappeared and the overlying dura was soft and granulating. About 2 weeks after the operation epithelial grafting was performed and a ragged hole a third of an inch in diameter was found in the dura over the attic, and through it the brain was visible. The graft was so arranged as to cover the opening, and when 2 weeks later the graft was exposed, the patient was very much improved. Five months later the area covered by the graft was seen to be pulsating.

Cerebral Abscess.—F. Gardemer¹ reports an interesting case in a young man of 21, who had suffered from left-sided chronic suppurative otitis media from infancy. There was an anterior superior perforation and slight tenderness over the mastoid; this becoming more severe, the temperature rising to 104° F., and the patient becoming somnolent and stupid, operation was decided on. The mastoid was opened and considerable cholesteatomatous material removed. Soon after the operation there was noticed marked paraphasia, principally affecting nouns. The temperature was normal and the pulse somewhat subnormal; there was ptosis of the left side, slight paresis of the right foot, and deviation of the tongue to the right. There was severe pain over and in the right eye and at the root of the nose. On exploring the temporosphenoidal lobe by passing a grooved director into it, an extremely fetid abscess was found at a depth of half an inch; this was drained by a tube which was shortened on the seventh day and removed on the tenth. There was steady progress toward recovery. The main interest in this case lay in the diagnosis on account of the presence of motor aphasia, alexia, and agraphia, the centers for which are quite distinct but are connected by a band of association fibers which runs from the temporal to the frontal lobe, and a second band which runs to the occipital lobe. Interference with the latter was probably due to pressure.

Treatment of Thrombosis of the Lateral Sinus Following Middle-ear Suppuration.—E. B. Dench² states that his experience has shown him that prompt and radical operative interference is the only plan to be pursued in these cases. Since so many mastoid cases require practically immediate operation, sufficient time for extensive observations upon the general condition of the patient, and especially his temperature, is not afforded in order that a definite determination can be made of infection of the lateral sinus. Dench states that the surgeon must decide during the primary operation the course to be pursued, and that it has been his practice to remove all evidences of carious bone and to follow the softened bone to the dura in all directions, if this is necessary to eradicate the infected tissue completely. If the sinus is exposed, unless it is perfectly healthy on palpation and inspection, it is invariably incised for the purpose of exploration; the aspirating needle is no longer used, as it was found in some instances in which infection had taken place and a clot had formed that the needle withdrew fluid blood. To avoid infection of the sinus during this exploratory incision, all purulent material must first be thoroughly removed; the antrum is then packed off by means of iodoform gauze, the entire field of operation thoroughly cleansed, and all

¹ Med. Rec., Aug. 5, 1901.

² Am. Jour. Med. Sci., May, 1902.

instruments carefully resterilized. The sinus wall should be exposed for at least $\frac{3}{4}$ of an inch and pressure applied to the upper part of the exposed area. The incision is then made close to the knee and at about the middle of the exposed area by means of a sharp straight bistoury. If there is a clot in the sinus, there will be either no hemorrhage at all or a very slight hemorrhage from below. A curet is passed into the sinus and the clot removed. Pressure is then made at the point of incision and the pressure at the upper part of the exposed area removed, and if free hemorrhage does not occur from above, a curet is introduced in this direction and the interior of the vessel thoroughly curetted until free hemorrhage is established. It is essential that this hemorrhage be established unless the lumen of the vessel is occupied by a firm, well-organized fibrinous clot; and when this is found, no attempt should be made to remove it. When free hemorrhage has been established from both ends, or it has been determined that a firm clot exists in the upper portion, it should be controlled by firmly packing the wound with iodoform gauze and isolating the area of the sinus from the middle ear and mastoid cells by firmly packing with iodoform gauze. This dressing can be allowed to remain for from 4 to 6 days, and should not be removed unless the temperature rise suddenly to 103° or 104° F. If all goes well after this procedure, nothing further needs to be done. If, however, in a few days the temperature shows evidence of systemic infection, it is advisable to proceed immediately to excision of the internal jugular vein. The vein is exposed by means of an incision extending from the sternal origin of the sternocleidomastoid to the tip of the mastoid process. As the vessel is more easily exposed in the lower part of the neck, it is dissected from its sheath first in this region and divided between two ligatures. The distal end is then secured with a hemostat, and, being raised by an assistant, is dissected upward until the common trunk of the temporal and facial veins is reached; this is surrounded by two ligatures and divided between them. Should the thyroid veins or a communicating branch between the external and internal jugular be sufficiently large as to require it, they are treated in the same manner. The internal jugular is then dissected out as high up as possible, and at the uppermost point surrounded by two ligatures and divided between them and removed. In this way the lateral sinus above is cleared, the internal jugular vein below is removed, and there remains only the jugular bulb, that portion occupying the jugular fossa. This can be cleansed by means of irrigation through the wounds previously made in the sinus. If the infection has existed for some time or the process has been very rapid, the tissues about the vein may be so matted together as to prevent complete dissection. In one such case the vein could be secured only by pulling it forcibly upward from beneath the clavicle; the tributaries were so much involved that they could be secured only by including in the ligatures a considerable amount of the adjacent muscular and fascial tissue. Two ligatures were passed around the vein close to the base of the skull and the vessel divided between them. The infective focus was thus cut off from the circulation, although the vein was left; the wound was packed with iodoform gauze and complete recovery followed.

Central and Cerebellar Abscesses Arising from Middle-ear Suppuration.—Charles A. Ballance,¹ before the Edinburgh Otological Society, stated that the primary source of infection should be thoroughly dealt with before the cranial cavity is entered. Cautious anesthesia is recommended on account of the tendency toward cessation of respiration in cases of cerebellar abscess; this embarrassment may become so great as to require artificial respiration in order to complete the operation. When pressure has been relieved by evacuation of the pus, spontaneous respiration is usually reestablished. The U-shaped incision, with the convexity upward, is recommended for the scalp and a $\frac{3}{8}$ -inch trephine for the skull. For temporosphenoidal abscess the center of the trephine should be placed $\frac{7}{8}$ of an inch above the suprameatal spine and the opening enlarged backward to a length of $1\frac{1}{4}$ inches by 1 inch vertically. The dura mater should likewise be opened by a U-shaped incision with the convexity downward, beginning with the knife and completing the incision with scissors in order to avoid the meningeal vessels. For the purpose of exploring the brain, Horsley's flat brain-knife is recommended; and, failing to find pus with this, it is advised that the finger be introduced into the brain-substance. [The introduction of such a large blunt probe as the finger, with the consequent pressure and laceration incident to its passage through the brain-substance, is certainly a novel and radical, not to say foolhardy, method of exploring for pus.] Irrigation of the abscess-cavity, is undesirable unless it fail to close, when a double tube should be introduced for the purpose of allowing ingress and egress of the irrigating fluid. *Hernia cerebri* is regarded as an evidence of sepsis, and a large opening in the skull is an important factor in its prevention. Great importance is attached during the after-treatment to keeping the bowels thoroughly open.

Temporal Periostitis of Otitic Origin Without Intramastoid Suppuration.—Luc² describes 4 cases of periostitis following slight middle-ear disease without involving the mastoid antrum or cells. The disease in these cases did not involve the retroauricular or mastoid surface, but was limited strictly to the temporal region and the superior wall of the external auditory meatus; there were absolutely no symptoms of mastoid involvement. In all the cases the swelling pitted on pressure, fluctuation could be elicited in some, and pain was either slight or entirely absent. When the presence of an abscess is determined, the treatment recommended is incision down to the bone the whole length of the superior meatal wall and drainage for a few days through the incision. For the first day or two pressure over the temporal region will empty the pus through the incision in the meatus, and by the end of the second day the drainage-tube can be removed and the wound allowed to heal.

Newer Pathologic Investigations in So-called Middle-ear Sclerosis.—Keller³ states that the process consists essentially in a transformation of the compact bony labyrinth into a spongy condition. The periostrum is not concerned in the process, which is not limited to the fenestra ovalis, and is therefore not simply an ankylosis between the margins of

¹ *Quarterly Med. Jour.*, Nov., 1901

² *La Presse Méd.*, May 8, 1901.

³ *Munch. med. Woch.*, No. 30, 1901.

this fenestra and the stapes. This spongification is distributed in spots all through the bony labyrinth, although its favorite seat seems to be the region of the oval window. It begins in the haversian canals, which are enlarged toward the membranous labyrinth and contain osteoblastic cells, which induce absorption of the bone. This explanation of the condition renders obvious the fact that the process is a chronic one and that therapy can have but slight effect.

Gout and Rheumatism of the Ear.—F. B. Kellogg reports a case of chronic catarrhal involvement which, while relieved by local treatment, recurred repeatedly. Sensitiveness in the tonsillar region suggested the idea of rheumatism, and 5-drop doses of the tincture of cimicifuga were administered. Prompt and complete cure was the result. [In view of the frequent liability of the structures included in the upper air-passages, especially the pharynx and tonsil, to rheumatic involvement the treatment in this case seems eminently rational. The case is highly suggestive and should lead to further and more accurate observations of rheumatic conditions of the eustachian tube and middle ear.]

Electric Treatment of Aural Vertigo.—Libotte¹ describes a special electrode for this condition. It consists of a wooden rod which terminates in an ebonite button and incloses a graphite thread. The patient is placed on an insulated stool and connected with the positive pole of a static machine; he then receives through the auricular electrode the negative discharge directly upon the structures of the middle ear.

Hysteric Deafness.—A. Wiebe² writes interestingly concerning his observations of hysteria as associated with the organ of hearing. While it is a field in which there are many conflicting opinions, and in which we as yet have gained little knowledge that is satisfactory, yet it is none the less interesting from both a practical and a scientific standpoint, and merits careful consideration.

New Method of Massaging the Ossicles by Means of Lucae's Probe.—C. J. König³ finds that the use of this probe is so often accompanied with pain in spite of attempts at local anesthesia that its efficient use is much interfered with. To avoid this objection, he dips the tip of the probe into melted paraffin, and by means of the soft tip thus produced there is much less pain, no excoriation or irritation of the membrane, and massage can be prolonged and the pressure increased to 60 or 100 grams.

The Functional Significance of the Round Window.—A. Frutiger⁴ states that the round window, while being of comparatively slight value for ordinary hearing, may be of considerable value in hearing the higher tones. In those diseases in which the hearing for the lower tones is much reduced, improvement can be obtained by tamponing the membrane of Scarpa. The chief use of the round window, however, is probably in connection with the aqueductus vestibuli, to regulate the tension in the endolymph and perilymph.

¹ Jour. de Neurol., No. 10, 1901.

² Deut. Arch. f. klin. Med., vol. LXXI, Nos. 2 and 3.

³ Arch. Internat. de Laryng., etc. Sept.-Oct., 1901.

⁴ Arch. of Otol., vol. xxx, No. 3.

Reflex Aural Symptoms Dependent upon Dental Caries.—E. B. Dench,¹ before the New York Odontological Society, spoke of the reflex disturbances that might arise in the body on account of caries of the teeth, and referred particularly to those of the ear. The most common aural conditions found as the result of carious irritation are otalgia, a feeling of stuffiness or oppression, and actual trophic changes, which may lead to sclerosis and a long train of unfortunate attendants which usually accompany it. Of these, the most common is otalgia, which may exist entirely independently of any intrinsic inflammatory affection of the ear. Extraction of the diseased tooth, which in children is usually the first molar, and in adults one of the wisdom-teeth, usually gives prompt relief. [Dench very properly draws attention to the fact that examination of the teeth is too often neglected in a routine search of the conditions of the upper air-passages. Even when the teeth are examined it is too frequently done in a perfunctory manner, and unless some very gross lesion be present it is very likely to escape the notice of the examiner.]

Diseases of the Organ of Hearing in Pernicious Anemia.—Schwabach² reports several of these cases. The deafness occurred somewhat suddenly and was of the obstructive type. The death of one patient afforded an opportunity for microscopic examination, which showed hemorrhages into the mucosa of the eustachian tube and tympanic cavity interfering with the free movement of the stapes in the oval window.

The Diagnostic Significance of the Reaction for Sulfocyanates in Diseases of the Ear.—E. Urgens³ states that the sulfocyanates of potassium or sodium, normally present in the saliva, are usually absent in chronic suppurative conditions of the middle ear, and that the progress of the disease can be estimated by the presence and extent of the reaction. The method of testing is as follows: To the collected saliva is added a saturated solution of hydriodic acid 1 part and starch paste 5 parts; if the sulfocyanates are present, a blue tint appears.

Crossed Acoustic Paralysis.—Gelle⁴ relates 9 cases, 5 of which were paralysis of the eighth nerve without involvement of the seventh, and 4 of paralysis of the auditory nerve along with paralysis of the facial on the same side. Tuberculosis and syphilis are practically the only causes.

A Case of Jacksonian Epilepsy due to Disease of the Ear.—De Champeaux⁵ describes a case of a young man with chronic suppurative condition of one ear, associated with which was a large polypus. There was also general enlargement of Waldeyer's ring. The polypus was first cauterized with perchlorid of iron, then treated by the instillation of alcohol, and finally curetted. With the improvement in the ear, disappearance of the epileptic seizures was noticed.

The Education of Mutes and Deaf-mutes by Means of Aural Exercises.—E. F. Snyder⁶ describes the methods used by Urbantschitsch and Bezold in training mutes and deaf-mutes. The latter uses

¹ New Orleans M. and S. Jour. Nov., 1901. ² Arch. of Otol., vol. xxix No. 4.

³ Voennomedicinski Journal, Feb., 1901.

⁴ Archiv. Internat. de Laryng., etc., Nov.-Dec., 1901.

⁵ Arch. Internat. de Laryngol., etc., Nov.-Dec., 1901.

⁶ Chicago Med. Recorder, Sept., 1901.

only the human voice, while the former employs musical sounds to stimulate the neuroepithelium of the auditory nerve; he uses the harmonica, trumpet, chimes, bells, etc., and is careful to avoid any sound which is disagreeable to the student. In young children the treatment consists in showing them certain objects and then shouting the names of the objects into the ear. If the necessary amount of hearing is present, the child in a short time endeavors to repeat the sound, and thus learns to correlate certain sounds with certain objects. When a suitable age has been reached, letters are shown and their equivalents in sound repeated into the child's ear. If lip reading has been learned, the sounds are first formed on the lips and then called into the ear. The exercises are begun with vowels, which are repeated over and over until the patient can distinguish the different ones. When this has been attained, the voice is lowered and the distance from the ear increased, in the endeavor to produce ability to hear the ordinary conversational tone. The consonants are then taken up and instruction in them given in the same manner; it is found that m, n, and l are the most frequently lost, while p, k, and r are the most readily recognized, and in fact can often be correctly enunciated by those who are entirely deaf. The next step is the use of simple words, and although every sound may not be understood, the patients learn to combine what they catch and from that construct the rest.

Local Anesthesia in the Ear.—H. Dupuy¹ recommends the instillation of the following solution for the purposes of anesthetizing the tympanic membrane as a preliminary to incision. He states that complete anesthesia will be produced in a few moments:

Cocain	0.3–0.6	(gr. v–x)
Alcohol (pure)	4.0	(f 5 j)
Anilin oil	4.0	(f 3 j)

Ear Disease and Life Insurance.—H. Burger² discusses the relations of the various forms of ear disease to life insurance and draws the following conclusions: Ear diseases should receive more attention than has hitherto been paid to them by insurance companies; in acute inflammations of the external and middle ear insurance should not be consummated until the disease has been cured; in severe cases of chronic external otitis insurance should be postponed, while in cases of simple chronic otitis there need be no delay; cases of chronic suppurative otitis media should not be accepted if there is mastoid or attic inflammation, tubercle, cholesteatoma, bone disease, facial paralysis, vertigo, unilateral headache, or a narrowing of the canal which would prevent free escape of the discharge; other cases of chronic suppurative disease might be accepted with increased premium after examination by an aurist; in cases of permanent perforation of the tympanic membrane a slight increase of premium should be exacted, while cases of recovered perforation can be accepted as ordinary risks; cases of chronic suppuration, which have been cured by a radical operation, can be accepted with an increase of

¹ The Laryngoscope, July, 1901.

² Klin. Vortrage aus dem Geb. der Otol. u. Pharyngo-Rhinol., Bd. v., Heft 4.

premium; marked bilateral deafness and severe vertigo should be considered causes for demanding an increase of premium.

Acute Diseases of the Mastoid Process and Their Surgical Treatment.—V. Hammerschlag¹ gives a very exhaustive treatise on the acute diseases of the mastoid process and their surgical treatment. While there is very little that is new in the article, it is a complete résumé of the literature to date.

Auscultation of the Mastoid.—J. A. H. Andrews² suggests using the stethoscope and tuning-fork in examining cases of suspected mastoid disease. When testing for the density of the mastoid, a stethoscope with a small bell is placed over the mastoid tip and the handle of a vibrating tuning-fork over the mastoid antrum; when the cells are filled with pus or granulation masses, or when the density of the bone is increased from proliferation, the sound-waves attain greater intensity and last longer than when the test is applied to the opposite mastoid. As the result of an examination of 200 mastoid processes in which no history of disease could be obtained, the results obtained were as follows: (1) The length of time the fork could be heard varied from 15 to 22 seconds, the average being 18. (2) The length of time the patient could hear the fork was usually slightly less than the time the surgeon could hear it with the stethoscope; in other words, bone conduction was less than auscultation. (3) Tuning-forks vary greatly in the time they can be heard by the normal ear. The principles underlying this method are: (1) The greater the density of and the more nearly uniform the medium, the greater will its sound-conducting property be. (2) Solid mediums of the same density transmit within certain limitations sound-waves in proportion to their relative thickness.

Symptoms Pointing to the Necessity for Operative Interference in Mastoid Suppuration.—Wendell C. Phillips³ emphasizes the importance of bacteriologic examination of the pus in cases of acute suppurative otitis media, and that the report should state whether staphylococci, pneumococci, or streptococci predominate, as it can be taken for granted that when the streptococci are in excess the pus is more virulent. Blood-examinations may be of service when there is a suspicion of infection of the lateral sinus, and should be made in all cases where general infection is suspected. The body-temperature cannot be depended upon as being indicative in any degree of the degree of mastoid involvement, but in complications such as sinus infection the temperature may become a very important factor. The symptoms indicating mastoid suppuration are as follows: A dull, heavy, nonlocalized pain diffused over the surface of the temporal bone and located particularly above and behind the ear. It may or may not be constant and may depend upon the freedom of the discharge into the external canal. Another symptom is tenderness, usually marked at the tip of the mastoid, but more significant when located over the antrum. The facial expression is usually indicative of anxiety rather than of severe pain, and the head usually hangs forward

¹ Wien. med. klin. Woch., Feb. 15, 22, Mar. 1, 8, 15, 22, 29, 1902.

² The Laryngoscope, June, 1901.

³ Am. Jour. Med. Sci., Dec., 1901.

with a tendency to lean toward the healthy side. External periostitis is another symptom which, as a rule, appears rather late. Inspection of the drum, especially of Shrapnell's membrane, may afford valuable information; when this membrane along with the posterior superior portion of the wall of the canal is seen to be bulging downward and forward, it affords strong confirmatory evidence of mastoid suppuration. Prolonged tenderness upon pressure over the region of the antrum associated with this bulging constitutes sufficient reason for operating, especially when examination of the pus shows the presence of streptococci or staphylococci. There are a number of other symptoms, such as rigors following vertigo, aphasia, choked disc, facial paralysis, uneven pupils, etc., which indicate complications rather than disease confined strictly to the mastoid. When they appear, it can be taken for granted that the process has extended into the lateral sinus, the dura, the cerebrum, or the cerebellum, and that there no longer exists any doubt as to the advisability of operation.

A Complete Mastoid Operation.—Charles A. Ballance¹ states that the successful outcome of operation for chronic otorrhea requires the fulfilment of two conditions,—the thorough removal of all disease and the healing of the large wound from the bottom. On account of the pain incident to the necessarily frequent tamponing of the cavity and the length of time often required before cicatrization is complete, the packing is often neglected. Ballance proposes to remedy this condition by doing 2 operations, the first of which he calls “the operation for the removal of the disease,” and the second “the operation for the healing of the wound.” In the first operation the usual incision behind the pinna is made and the latter is held forward with a retractor. The opening into the bone is made by means of an electric burr or a gouge, and while this is being done a Stäcke's protector is used to shield the facial canal and external semi-circular canal. The posterior wall of the bony meatus is removed by means of angular forceps and the diseased tissue by means of sharp spoons of various sizes. This should be done under a bright light, and the remaining bone should be clean and hard. The inferior wall of the cartilaginous canal is divided vertically well into the concha, the incision being prolonged with a curve upward and backward to the level of the anterior end of the helix. The posterior wall of the meatus is then pushed upward and backward and attached to the mastoid flap by silkwormgut sutures. The bony cavity is then plugged with gauze through the meatus. The second operation may sometimes be done at the end of a week, but in adults usually not for two or three. In performing this second operation the original incision is opened and the pinna displaced forward, care being taken to arrest whatever oozing there may be from the granulating surface. Large epithelial grafts, as thin as can be obtained, are taken from the thigh or arm; and if one large enough to cover the whole area can be obtained, it can readily be applied in one piece. It should cover the anterior wall of the cavity, the anterior part of the roof, the superior wall of the enlarged meatus, the inner wall of the attic and tympanum,

¹ *Me l.-Chir. Trans.*, 1900, LXXXIII.

the tegmen antri, the ridge formed by the facial canal, and the inner wall of the antrum. The grafts should be firmly pressed into the cavity and protected by gold-leaf, after which a narrow strip of dry iodoform gauze is packed in and allowed to remain for a week. At the end of the week the gauze is removed, and 3 or 4 days later the gold-leaf is picked out with forceps. As improvements to the above, William Milligan¹ recommends that in order to avoid the constant oozing at the second operation the original incision be opened the day before. He also suggests that the grafts be floated into position by filling the cavity with warm salt solution, which is afterward sucked out by a pipet.

A Simple Method of Closing the Persistent Retroauricular Orifice after the Petromastoid Operation.—Lemoyez and Mahu² state that the opening should be closed, both on account of its unsightliness and on account of the opportunities it offers to injury. With regard to when the opening should be closed, the discussion is divided into that of cases in which operation has been required for chronic otitis and for cholesteatoma. In the former closure should be deferred until suppuration has entirely ceased and the epidermis of the cavity is dry, solid, adherent, and without desquamation or eczema. In cases of cholesteatoma the opening should remain patulous until there is no sign of additional cholesteatomatous formation. The method of closure advocated is as follows: The patient is chloroformed and the temporomastoid region shaved and rendered surgically clean. Two incisions are made posterior to the opening and down to the periosteum; they are half a centimeter above and below the opening and are joined by two other incisions, the whole forming a trapezium. The skin is raised well into the cavity in the shape of two wings, which are turned inward toward each other, and when sutured completely occlude the opening. To avoid tension a semilunar incision over the mastoid is made about 15 mm. from the posterior incision. Healing takes place in about 5 days. By this method is obtained a cutaneous covering for the cavity which communicates with the exterior only through the auditory meatus and a pinna in normal position.

The Diagnosis and Treatment of Mastoiditis.—E. B. Dench,³ in discussing the symptomatology of mastoiditis, states that pain in the region of the mastoid is the most prominent symptom in adults; it may be accompanied by a profuse discharge from the ear, or a discharge which has been previously profuse may suddenly become diminished and followed by a marked exacerbation of the pain. In those of phlegmatic temperament the pain is frequently not so severe, and will manifest itself perhaps in sleeplessness. Prostration is present to a greater or less degree. A rise in temperature, while in children of value in making a diagnosis, in adults is of comparatively little importance, and its absence should never be taken as an indication that the mastoid is not affected. [This statement is of more than passing interest on account of the fast growing tendency to call mastoid disease "the appendicitis of the head," since it is now well recognized that in appendicitis the value of the

¹ Brit. Med. Jour., 11.

² Ann. des Mal. de l'Oreille, etc., June, 1901.

³ Jour. Am. Med. Assoc., July 27, 1901.

thermometer as indicating the severity of the intraabdominal condition is practically *nil*.] Profuseness of the discharge is mentioned as being possibly indicative of mastoid trouble, because when it is prolonged the aurist must eventually conclude that a larger area of mucosa than that appertaining to the tympanic cavity must be involved in order to account for the excessive quantity of purulent discharge. In these cases when drainage seems to be perfectly free there are seldom pronounced symptoms of the mastoid involvement; the symptoms are subacute in character, the patient becomes gradually weaker and thinner and shows some evidence of general infection. When the discharge becomes suddenly diminished, there is usually a slight temperature rise in adults and considerable in children; there is usually associated considerable pain. Facial paralysis occurring in the course of a middle-ear inflammation is no longer regarded as being pathognomonic of mastoid involvement, as it is a well-recognized fact that this form of paralysis is found quite as frequently in cases of inflammation of the middle ear unaccompanied by mastoid extension as in those cases in which the mastoid is affected. Careful palpation of the mastoid close to the attachment of the auricle will elicit marked tenderness in a majority of the cases in which inflammation exists; the point of acute tenderness is usually located immediately over the mastoid antrum. In determining this, care should be exerted that the auricle is not pressed upon, but that the palpating finger should press backward upon the bone. Tenderness over the tip of the mastoid is of diagnostic importance mainly in those cases in which an empyema has emptied internally beneath the insertion of the sternocleidomastoid muscle. In this condition there are found associated other symptoms of pus, redness, swelling, etc. Tenderness upon pressure over the mastoid emissary vein Dench has found to be of no value. Examination of the meatus with the otoscope will give certain points of positive value; sinking downward of the upper and posterior wall of the canal and bulging of the upper portion of the tympanic membrane, particularly if associated, render very probable the presence of purulent inflammation of the mastoid cells. Fluctuation behind the auricle usually means that pus has perforated the mastoid cortex and elevated the periosteum. This is seen more frequently in infants than in adults, on account of the more prompt recognition of the underlying causative factor in the latter. Edema behind the ear is more frequently a sign of a furuncle on the posterior wall of the canal than of mastoid involvement. The treatment consists in the first place of complete rest, fluid diet, saline purgation, and free drainage through the canal; the latter is best accomplished by means of a free incision through the tympanic membrane beginning close to the posterior margin of the membrane at a point below the umbo and extending upward into the tympanic vault; when this has been reached, the incision should be carried upward and backward so as freely to incise the numerous reduplications of the mucous membrane found in this locality; the incision should then be still further continued outward on the upper and posterior wall of the canal to the extent of $\frac{1}{2}$ to $\frac{3}{4}$ of an inch, and incising all the tissues down to the bone. This should be followed by

frequent irrigations with warm antiseptic solutions, and is of great value on account of its depletion and the relief of tension afforded to the floor of the vault and mastoid antrum. Dench does not favor leeching of the mastoid; and as regards the use of cold, believes that while possibly it may prevent extension of the inflammation to the superficial structures, it masks the signs of inflammatory trouble within the bone. Should cold be used, it should be used continuously and removed only for purposes of examination. "Nothing is more dangerous than to use the ice-coil for 24 to 36 hours, then remove it because the patient is free from pain, and in a day or two re-apply it because the pain has returned. The mere fact that the pain returns is decisive evidence that bony involvement is present and that operative interference is absolutely essential." In those doubtful cases in which the disease is moderate in degree an exploratory operation should be performed, and the general condition of these patients has invariably improved immediately after the operation, contrasting most favorably with those cases in which a middle-ear suppuration has continued for months after the use of abortive treatment. The particular operation to be selected depends upon the individual case, and no matter which one is selected the most thorough asepsis should be practised. A very free incision should always be used, and, beginning below the tip of the mastoid, should parallel the line of attachment of the auricle to a point above and $\frac{1}{2}$ of an inch behind the center of the external auditory meatus. The incision should include all the soft parts down to the bone, and after the bleeding vessels have been secured with hemostatic forceps the anterior flap is pushed forward with a periosteal elevator until the upper and posterior margins of the bony meatus are exposed. The rest of the mastoid should be cleared by treating the posterior flap in the same manner, and should be kept exposed by means of retractors. The antrum should then be entered, even should a perforation already exist in the mastoid cortex. Should the operation be of exploratory character, it will often not be necessary to go any further; while should the mastoid be found diseased, the operation can be continued on backward. Should the latter be the case, all the mastoid cells must be exposed and curetted away with a sharp spoon, care being taken thoroughly to remove the tip of the process; not infrequently the main portion of the mastoid may be found to consist of fairly healthy bone tissue while the tip is in a very bad state of caries. Sometimes it will be found necessary to expose the lateral sinus in exploratory measures. Should it appear perfectly normal, it will not be necessary to open it; but should there be the least suspicion of the presence of a thrombus, the sinus should be freely opened and the offending structure removed. Should the technic be perfect, there is not the slightest danger in exposing or opening even a healthy sinus.

A Fatal Case of Suppuration of an Aberrant Mastoid Cell.—Moure and Lafarelle¹ report the case of a man of 46, in whom the mastoid had to be cleaned out. All diseased tissue was curetted down to healthy bone and the wound healed by first intention. About a month after the operation very suddenly there developed violent vomiting, headache,

¹ Rev. Hebd. de Laryng., etc., Jan. 26, 1901.

constipation, high fever, and rigors; symptoms of general meningitis soon followed, and in 9 days the patient died. Necropsy proved the correctness of the diagnosis, and the source of the meningitis was found to lie in a pus-filled cavity in the posterior part of the mastoid. It was situated above a plane passing through the upper border of the external meatus and 1 cm. behind a line passing through the pit of the mastoid; it was completely separated from the operation cavity by a wall of healthy bone 0.5 cm. in thickness and was limited internally by the lateral sinus, which, though surrounded by pus, was perfectly healthy. The course of the infection was probably from the antrum to this cell and thence to the meninges by the lymph-channels. The operation cavity was found at the necropsy to be entirely healthy.

Mastoid Operations under Schleich's Local Anesthesia.—G. Alexander¹ used this method in several cases in whom it was considered inadvisable to induce general anesthesia. Some of the operations were quite extensive, and in order to diminish the shock and sound, the head of the hammer used in chiseling was covered with muslin. The degree of anesthesia obtained, although not absolute, was sufficient to insure the patient's comfort, and at no time did either dangerous symptoms or unpleasant sequels arise. The operations lasted from $\frac{3}{4}$ of an hour to an hour, and solutions of a strength of 1 to 2 grains of cocain hydrochlorate to 1 to 2 ounces of distilled water were used.

¹ Wien. klin. Woch., Aug. 15, 1901.

ANATOMY.

By C. A. HAMANN, M.D.,
OF CLEVELAND, OHIO.

BONES.

Growth of Skull.—Belz¹ makes the assertion that the skull may continue in growth after the cranial sutures have united, which increase is stated to be the consequence of an internal transposition of the bones. In his own skull the increase in the circumference from the twentieth to the thirtieth year was noted to be 1 cm., and up to the fiftieth year again as much. During this growth of the skull its tendency is toward dolichocephalism as the frontal sinuses become strongly developed.

Prominences of Skull due to Convolutions of Brain.—Schwalbe² states that in certain animals the cerebral convolutions are impressed upon the cranium to such a degree as to be detected on the external surface. Such, for instance, is the case in the fish-otter and lemur. In man certain of these convolutions may also leave their imprint. In the occipital region a protuberantia cerebellaris and at times even a protuberantia vermicularis are to be found. The sulcus sphenoparietalis corresponds with a portion of the fossa Sylvii and the parietal and temporal lobes are also to be distinguished. A certain prominence also corresponds with the third frontal convolution. The protuberantia gyri temporales is almost always present, and at times a portion of the third temporal convolution, more seldom of the first temporal convolution, are to be distinguished. These prominences in all races are most frequent in the female skulls.

Lemurian Tubercle.—From an analytic study of 500 inferior maxillary bones, Bosse³ states that the processus lemurinus s. Sandifortii, a muscular process at the angle of the mandible, was present in 83 %. The long axis of the coronoid and condyloid processes are said to be parallel to each other and the angle which the two halves of the bone form to be 70.5 degrees. The angle formed by the continuation of the axes of the condyloid processes is 141 to 150 degrees and the interval between the two angles of the mandible 10 cm.

Incisive Bones.—On the basis of a comparative analytic study, Anderson⁴ concludes that the ossa incisiva are portions of a bony ring which incloses the apertura pyramidalis. In certain carnivora these bones

¹ Zeitschr. f. Ethnol., 1901.

² 27 Wandervers. d. suddeutsch. Neurolog. u. Irrenärzte, 1902.

³ Inaug. Dissert., 8 Königsberg.

⁴ Tageblatt d. 5 internat. Zoologen Cong. in Berlin.

tend to replace the nasal bones in part. The incisive bones are furthermore said to occupy an intermediate position between the bones of the face and those of the skull.

Nasal Bones.—W. L. H. Duckworth¹ reports a nasal bone of unusual length which was discovered on an ancient Egyptian skull. The bone under consideration, the left nasal, was prolonged downward to an unusual extent along the margin of the nasal aperture. On the right side the condition was obscure owing to the destruction of bone in this region. As the explanation of this conformation two theories are advanced, one being the ossification of this portion of the superior lateral cartilage, the other an abnormally developed facial extension of the uppermost portion of the premaxilla which in the gorilla is constant and bilateral. Confirmatory of the latter theory was the presence of two or three small foramina which seemed to indicate the situation of a former line of junction of two separate bones.

Frontal Sinuses.—Sieur,² in 150 frontal sinuses examined, reports that in one-third of these only very small cavities were present, which could not be termed a true sinus frontalis, but were rather to be viewed as a dilation of the upper end of the ductus nasofrontalis. The position of these cavities coincided with the upper internal angle of the orbital aperture, at which a thin and narrow osseous lamella of the superior maxillary bone is inclosed posteriorly by the lamina papyracea of the ethmoid and inferiorly by the lacrimal bone. Clinically the importance of this variation finds its application in the surgical interventions on the sinus frontalis; the opening into the same should be established at the point mentioned in order that when these small cavities are present they should not escape detection.

Mastoid Cells.—Stanculenu and Depontre³ call attention to a few anatomic variations of the mastoid cells. In 100 temporal bones examined of persons of all ages with nondiseased ears, they determined that a part of the mastoid cells are frequently displaced. These displaced cells occur either near the dura (cellulæ mastoideæ posteriores) or in a proximate position to the sinus (cellulæ juxtasinusales). In 6 out of the 100 specimens the misplaced cells were separated from the mastoid cells by a layer of compact bone. They may therefore, as stated by the writers, be easily overlooked in operations for purulent ear diseases, and would then subsequently give rise to meningitis or jugular phlebitis, as is asserted to have occurred in five patients.

A hyoidean apparatus in man in which a separate epihyal bone was developed is described by W. Turner.⁴ In the specimen found in a male no vestige of a stylohyoid ligament was to be detected on the right side, its place being completely occupied by a bar of bone 56 mm. long, this being the homologue of the epihyal bone of the dog and many other mammals. Above this bar of bone, articulated with the styloid process

¹ Jour. Anat. and Physiol., xxxvi, Pt. III, 1902.

² Rev. Hebdom. de Laryng., d'Otol. et de Rhinol., 1901.

³ Ann. de Mal. de l'Oreille, etc., xxvii, No. 10.

⁴ Jour. Anat. and Physiol., xxxvi, Pt. II, 1902, 162.

by means of a movable joint, and below, an articulation between it and the lesser cornu of the hyoid bone was also noted. The styloid process of this side was somewhat shorter than that on the left side, and from two to three times as thick as customary, and instead of terminating in a point ended in an expansion.

Asymmetry of Vertebral Column.—Charpy¹ attempts the solution of the constant lateral asymmetry of the vertebral column. This physiologic scoliosis is, according to the writer, totally absent in but 7 % of full-grown adults. It is also not present in the newborn in the child and in all vertebrates. The reasons which have been heretofore variously advanced for this lateral deviation are: the position of the fetus *in utero*, the mechanical traction exerted on the right side of the vertebral column by the viscera, the position of the pulsating descending aorta on the left side of the vertebral column, the fact that the left lower extremity is more frequently used as the supporting member, etc. These various hypotheses do not, however, give a clear elucidation for the cause of the lateral scoliosis, which most frequently consists in an upper left convexity, a median right convexity, and a lower compensatory curve whose convexity is also directed toward the left. In 14 %, however, these convexities are directed toward the opposite direction. Charpy draws the conclusion, which conforms with that originally advanced by Bichat, that the more frequent use of the right arm—i. e., right-handedness—is the direct cause of this vertebral asymmetry.

Costotransverse Foramen.—Barclay Smith² refers to an instance of what may be termed a costotransverse foramen in the first sacral segment. As viewed from the superior aspect this bone presented a roundish foramen in the right lateral mass which led downward into the space common to the anterior and posterior sacral foramina between the first two segments. The first sacral vertebra in general presented otherwise a marked asymmetry, the right side being disproportionately the larger, the sacral canal on this side more capacious, the spinous process deflected toward the right, and the mammillary process also being of greater dimensions. The auricular surface on this side was, moreover, also more extensive and more vertically elongated, but with this exception the asymmetry remained confined to the first sacral segment. In another example of vertebral asymmetry, a twelfth thoracic vertebra, the upper articular processes of the two sides compared presented a remarkable contrast, while the lower processes were normal. The right superior articular process was of the normal thoracic type, being surmounted by the stunted tuberculated process so characteristic of the twelfth thoracic vertebra, while the left articular process was typically lumbar, having both the maxillary and accessory processes well marked. Altogether, 5 examples of this anomalous condition are stated to have been encountered.

Structure and Function.—A most lucid demonstration of the interdependence of structure and function is given by A. Thomson³ in a

¹ Jour. de l'Anat., Anno xxxvii, No. 2, p. 129.

² Jour. Anat. and Physiol., xxxvi, Pt. iv, 1902.

³ Jour. Anat. and Physiol., xxxvi, Pt. ii, 1902.

comparative study of the lower epiphyseal suture of the femur. In an examination of 40 animal species, including the primates, carnivora, ungulata, edentata, and marsupialia, a great variety in the outline of this suture was encountered. These variations are stated to be the consequent result of the uses and strains to which the limbs are habitually subjected, such as position, range of movement of the knee-joint, and such actions as climbing, leaping, and springing. In man this suture assumes the simplest form, as the limb is mainly subjected to the vertical strain associated with the bipedal position. The general shape of the suture in this instance is rounded from side to side, and from before backward, so as to fit into the shallow concavity on the upper surface of the epiphysis. When the lower end of the diaphysis is carefully examined, however, 4 slightly projecting areas are to be seen, between which two shallow furrows placed at right angles to each other course. The upper surface of the lower femoral epiphysis is correspondingly divided into 4 shallow fossæ in which the aforementioned projecting areas are embedded. This structural formation is admirably adapted to resist a vertical strain, but is not well suited to withstand a thrust directed anteroposteriorly. In the elephant also, in which the limbs are also subjected to a vertical strain, the arrangement of the suture resembles that of man, and is simpler than the ordinary quadruped type. The latter assumes the form of a series of conical projections arising from the lower end of the diaphysis and which are embedded in corresponding hollows of the upper surface of the epiphysis. An extremely complex joint is found in animals whose limbs are subjected to constant shocks and jars from the habit of leaping from rock to rock, as in the wild Corsican sheep. Three pair of diaphyseal cone-like projections with corresponding epiphyseal fossæ are present in this animal, which are naturally interlocked so intimately that strains from every direction can be withstood. Further instances of modifications of this suture as dependent on habit and the intermediate forms between certain animal species are presented. From the consideration of the facts the author concludes that the form of the epiphyseal suture is determined by the function of the limb, and since that function is exercised during a period of life in which the structure is still undeveloped and incomplete, it may be readily assumed that the structure of the epiphyseodiaphyseal suture is determined by the function of the limb.

Fissure of Femoral Neck.—A new affection, "congenital fissure of the femoral neck," is described by C. Helbing.¹ In a report of 4 cases of the same, 3 girls and 1 boy, of the ages of 3½, 4, 2½, and 19 years respectively, the congenital fissure was established by means of the Röntgen rays. The characteristics of the femoral neck when this fissure is present, as seen in the shadowgraph, are a high position of the trochanter major, a shortening of the neck, and a very noticeable decrease in the angle between the femoral neck and the shaft. In one case, a girl 3½ years of age, the angle on the left side measured 90 degrees, and but 70 degrees on the right; and in another case, a girl 3½ years old, it measured 90 degrees

¹ Deut. med. Woch., 1902, No. 15, 259.

on the right side and 50 degrees on the left. The congenital fissure may be either unilateral or bilateral, and in the latter case symmetry is possible. It is situated to the inner side of the epiphyseal line, which may, however, be absent. That the congenital fissure is not an epiphyseolysis seems indicated from its position, and, moreover, also from the fact that the growth of the patient was in no instance impaired. In 3 of the 4 cases, however, the epiphyseal line of the femoral head could not be detected, so that the supposition that a congenital displacement of this line may have aided in the production of the congenital fissure is not altogether excluded. Trauma, it is stated, could not have been one of the determining factors in these cases, as the anamnesis was totally negative in this respect, and the symmetric appearance in the bilateral cases also tended to disprove this. Its cause is therefore left undetermined and remains as mysterious as that of coxa vara congenita, and congenital hip dislocation. In one case an interrelationship seemed to exist between this congenital fissure of the femoral neck and congenital hip dislocation, one child being affected with the former, and the other, of the same parentage, with the latter. Coxa vara congenita may also be somewhat closely related, and it is probable that some of the reported cases of this kind would more properly be placed in the category of congenital fissure of the femoral neck. The clinical picture of this defect closely resembles that of congenital hip-joint dislocation. In all cases the affection became apparent with the first attempts at walking. There existed a more or less marked lumbar lordosis, a duck-like walk of the affected side, slight limitation in flexion, a more marked limitation in abduction, a slight outward rotation of the leg, etc.

Patella.—A common variation of the patella, a depression in the superoexternal portion, which, according to F. C. Kempson,¹ has not as yet been reported, is referred to by that author. In the typical specimen this depression appears as a concavity along the margin of the bone extending from a point about half an inch from the middle line to a point half-way down the outer margin. The upper limit is defined by a slight tubercle, the lower by a sharp spinous process, which is directed upward and outward. Numerous gradations are stated to exist between those patellas having a well-marked notch and those in which no trace of such an indentation is to be detected. No reason can be assigned for the inconstancy of this depression, but a definite connection between its presence and the insertion of the vastus externus is assumed to exist.

From a comparative study on man and certain of the lower mammalia, Joachimsthal² deduces that the division of the posterior surface of the human patella into an upper articular and a lower nonarticular portion, which, peculiar to man alone, are placed at an angle to each other, is the direct resultant of the normally low position of this bone in the human species. In the mammalia, rabbit, guinea-pig, rat, dog, and cat, the high position of the patella eliminates the angulation of the posterior surface, there being, on the contrary, a concavity of the posterior surface which is

¹ Jour. Anat. and Physiol., xxxvi, Pt. iv, 1902.

² Arch. f. klin. Chir., lxxvii, 2, 342.

totally articular. That this is solely dependent on this one factor is indicated in those cases of permanent high position of the patella as occurring in Little's disease, in which congenital spastic contractures of the muscles of the lower extremity and a probable lengthening of the quadriceps extensor tendon occurs. In these cases, as determined by the Röntgen rays, the shape of the patella conforms with that of the mammalia mentioned. Joachimsthal also reports 3 cases of the rare anomaly of segmented patella. While in the first of these the segmentation of the patella into an upper larger portion and an inferior was probably the result of certain spastic muscular contractures which had occurred during childhood, in the other a congenital disturbance had given rise to a longitudinal separation of the lateral fourth of the bone from its main portion.

Position of Great Toe.—On the basis of its asymmetry, J. Griffiths¹ deduces the normal position of the hallux to be in the direction of a curve whose convexity is turned inward toward the opposite foot, so that this member is directed outward from the inner line of the foot, as well as from the line of the innermost metatarsal. The asymmetry of the hallux is most obvious in both phalanges. In the first phalanx the inner border is longer than the outer, so that when the phalanx is laid with its proximal end on a horizontal plane it inclines to one side. The direction of this inclination can be used to determine the respective side to which the phalanx belongs, for when this bone is placed on its proximal end with its plantar surface forward it inclines toward the side to which it belongs. In consequence of this inequality in length of the two sides the distal articulation is on a slant in the direction from within outward and a little backward. In the distal phalanx the asymmetry is even more marked, the inner border being also longer and the inclination in the same direction more apparent. As viewed from above, the first phalanx is neither in line with the terminal phalanx nor with the inner metatarsal bone, there being a progressive tendency toward external deviation. Between the basal phalanx and the metatarsal this deviation usually averages about 10 degrees, although in some examples it is so small as to be difficult of determination. In other instances, however, it may reach 20 degrees. The terminal phalanx invariably deviates outward, and it may diverge as much as 20 degrees. These characteristics of the great toe were present in the fetus, in whom external influences cannot be considered a causative factor. They were also found in the ancient Greeks and Egyptians and in the savage. This position of the hallux corresponds to a line practically bisecting the lateral range of its movement, or the mean between extreme abduction and full adduction. The axis of the first phalanx, if prolonged in a posterior direction, would leave the foot just behind the metatarsophalangeal joint and pass to the inner side of the heel, and not, as Meyer has adduced, emerge at the center of the heel. The outward inclination of this toe, it is stated, is merely in conformation with its functions during walking: viz., (1) to receive and bear the weight of the body, and (2) to give the last push forward.

¹ Jour. Anat. and Physiol., xxxvi, Pt. iv, 344, 1902.

MUSCLES.

Mechanism of Articulations.—R. du Bois Reymond¹ states that the mechanism of the articulations in the lower extremity and their ligaments are insufficient to maintain the equilibrium in the erect posture, and that muscular action becomes necessary to accomplish this. In this position the line of gravity lies anterior to the knees and a tendency exists for the thigh and abdomen to fall forward. To counteract this, the muscles of the calf are put on tension, and extension of the knee when the body is erect is thereby maintained. In standing on the toes the body also tends to fall forward, but the flexor tendons of the toes firmly plant these on the ground, whereby the body is thrown backward and the required equilibrium is established. In raising one's self on the toes the tension of the flexor digiti decreases and that of the gastrocnemius and other muscles of the calf increases, while the reverse occurs when the foot again resumes its normal plantigrade position.

Abdominal Muscles.—In a comparative study of the abdominal musculature of man and certain of the lower animals Dall'acqua draws the following conclusions pertaining to the human being: (1) That the sheath of the rectus abdominis is formed ventrally above by the aponeurosis of the pectoralis major. Below this to the first inscriptio tendinea by the aponeurosis of the obliquus externus; from this point to the inscriptio tendinea umbilicalis by the aponeurosis of the obliquus externus and the ventral lamina of that of the obliquus internus to the symphysis pubis from the inscriptio tendinea umbilicalis downward by the aponeurosis of the obliquus externus and the ventral lamina of the obliquus internus and transversus. Dorsally the sheath begins at the processus xiphoideus, and in its downward extent to the umbilicus is formed by the dorsal aponeurotic lamina of the obliquus internus and transversus. The obliquus internus terminates at the linea semicircularis, while the linea Douglasi denotes the termination of the aponeurosis of the transversus, from which but a very thin lamina extends to the pubic bone. (2) The ligamentum Poupartii is formed in its median two-thirds by the thickened aponeurosis of the obliquus externus, in its lateral third by the aponeurosis of the obliquus externus, tendons of the obliquus internus transversus, and ligamenta inguinalia conjoined. The tendon of the obliquus internus has two insertions, between which passes the nervus cutaneus femoris externus. The so-called ligamentum inguinale arises from the internal lip of the crista ilii, passes anterointernally along the lower border of the obliquus internus, and terminates in the fibræ intercrurales of the inguinal ring. The ligamentum Gimbernatii is a derivative of the aponeurosis of the obliquus internus, and the ligamentum Collesi is formed from the fibers of the lower pillar of the external abdominal ring, also from the intercrossing fibers of the obliquus externus. (3) The posterior aponeurosis of the transversalis has its origin for the posterior lamina from the spinous processes of the lumbar vertebræ, and for the anterior lamina from the transverse processes of the same vertebræ.

¹ Monats. f. orthop. Chir. u. physik. Heilmeth, 1, 8, 113.

Petit's Triangle.—In a treatise relating to the lumbar region, with special reference to the point of exit of lumbar hernia, R. v. Baracz¹ reports some anatomic observations on the trigonum Petittii, and on the spatium tendineum lumbale. Petit's triangle in 76 lumbar regions examined was present in 63.13 % and absent in 36.84 %, 12 times the absence being bilateral and but one unilateral. The size of the triangle was found to be extremely variable, in that at times it represented a small slit in the interval between the latissimus dorsi and the external oblique, while in other instances a capacious triangle was found whose basis (crista ilii) measured 5 or 6 cm. Its floor was usually formed by the muscular portion of the internal oblique; in certain instances it was, however, in part muscular, and in part tendinous, or altogether tendinous, this being dependent on the degree to which the muscular bundles of the internal oblique extended to the lateral border of the erector trunci. The spatium tendineum lumbale, which has also been termed the lumbo-costo-abdominal triangle of Grynfeldts, or Lesshaft's triangle, and which is bounded above by the inferior border of the serratus posticus inferior, and the internal border of the twelfth rib, medially by the erector trunci, laterally by the internal oblique, and the posterior border of the external oblique, and whose floor is formed by the medial aponeurotic portion of the transversalis, was found in almost all cadavers. Out of 76 examinations it was present in 93.5 %, absent in 6.5 %. The configuration of this space was variable, its outline not always being that of a triangle or rhomboid, but occasionally being deltoid, trapezoid, or polyhedral shaped, so that there were to be distinguished a spatium tendineum rhombicum deltoideum, trapezoidiforme, rhomboideum, triangulare, and polygonale. The most common form, however, was the quadrangular with oblique angles, the triangular form occurring from the presence of a supplementary anomalous digitation of the serratus posticus inferior. In this form two triangles superimposed upon each other were usually present, the anomalous digitation representing the diagonal of the quadrangle. The outline and extent of the spatium tendineum lumbale is stated to be entirely influenced by the development insertion of the structural boundaries as well as other factors, such as the length of the twelfth rib, the extent of the muscular portion of the internal oblique—i. e., whether, as such, it reaches to the lateral border of the erector trunci, or becomes tendinous before reaching this point, etc. The space is especially broad in those instances in which the twelfth rib has been hindered in its development when it extends to the eleventh rib. This condition is constant in small children. In the adult such a spatium is subdivided into two unequal portions by the digitation of the external oblique, which is properly attached to the twelfth rib when this bone is present. These subdivisions, which may be termed the spatia tendinea septa, are each perforated by the arteria, vena, and nervus intercostalis of the eleventh and twelfth rib respectively. The spatium tendineum lumbale as determined by dissection is the weakest part of the lumbar region, and within this space the perforation of the arteria, vena, and nervus intercostalis are in their turn the points

¹ Arch. f. klin. Chir., 1902, LXVIII, 658.

of least resistance, so that consequently lumbar hernia and gravitation abscesses most readily escape through this space. Petit's triangle, on the other hand, owing to its greater resistance, is not such a favorable point for the exit of hernia, which probably does not occur through this space, as median to it there is situated a point in the tendinous portion of the latissimus dorsi above the crest of the ileum the weakness of whose resistance is second to that of the spatium tendineum lumbale, and through which the lumbar branch of the arteria and vena ileolumbalis pass.

Lumbrical Muscles.—Miss Reinhart¹ corroborates the findings of Kopsch, in 1898, on the lumbricales manus muscles. One hundred hands were examined, in 39 % of which the insertion of all four lumbricals occurred on the radial side of their respective fingers. In 43 % the third lumbricalis muscle had a double insertion, one head of which was attached to the ulnar side of the middle finger and the other to the radial side of the ring-finger. In the remaining cases various forms were encountered. The view taken by the French anatomists that the third lumbricalis muscle has its normal insertion on the ulnar side of the middle finger is said to be dependent on faulty observation, for this occurrence was found by Kopsch in but 10 % and by Reinhart in 12 %. Racial differences between the French, Germans, and Russians in the insertion of these muscles, it is said, do not exist.

Pronator Radii Teres.—R. Kolster,² in a comparative study on the mammalia concerning the pronator teres muscle, noted that in those animals in which pronation is deficient this muscle acts as a flexor of the forearm. In wild rabbits the pronator teres is much better developed than in the domesticated varieties of this species.

Iliopsoas Bursa.—F. B. Lund,³ considering the surgical importance of the iliopsoas bursa, reports the results of his anatomic investigations, in which the right hips of 18 subjects were examined, and the size, position, and extent of this bursa was ascertained. Its extent is, according to the writer, frequently greater than is usually assumed; in about one-half of his dissections it reached above the pelvic brim. It may also extend for a certain distance above the iliopectineal line. In only 3 of the subjects examined was this bursa found to communicate with the hip-joint.

Cricothyroid Muscle.—The function of the cricothyroideus muscle is discussed in detail by H. Krause.⁴ In two previous papers, published in 1899 and 1900, the writer had already referred to the approximation of the vocal cords which occurs during each expiration, and which is caused by the contraction of this muscle. This approximation of the vocal cords in the expiratory act was also shown partially to persist in animals after the division of the recurrent laryngeal nerve. In the more recent investigations it is disclosed that this movement is produced by the synchronous contractions of both cricothyroid muscles. This muscle is therefore concluded to be an automatic and concomitant expiratory

¹ Anat. Anz., II. 5-6, 129.

² Anat. Hefte, xvii, H. 3-4, 671.

³ Boston M. and S. Jour., CXLVII, 345, 1902.

⁴ Mon.-Schr. f. Ohrenkde. u. s. w., xxxv, 2, 1901.

muscle, which in its action is antagonistic to that of the posticus muscle, for after the dilation of the glottis by the posticus during inspiration, the cricothyroid, at the moment the expiratory act is assumed, is capable of immediately placing the glottis in the position essential for the phonatory function.

A. Juarasz¹ attempts the definite determination of the **true function** of the cricothyroid muscle, which has been variously stated to have its origin at the cricoid and thyroid cartilages. Anatomic and physiologic deductions are more in accordance with the former view, while experimental investigations have partially substantiated the latter assumption, with which Juarasz also agrees. He states that the cricothyroid is to be classed in that group of muscles which have the broad attachment at one end and converge toward the other. Such muscles functionate in a direction from their broadest attachment toward their narrower insertion, while the thyroid cartilage with its attached extrinsic muscular structures offers a point of definite fixation for the origin and action of this muscle, the same cannot be said of the cricoid cartilage. That the latter is not the origin of the cricothyroid seems to be furthermore indicated in the difference of position of the vocal cords during respiration and phonation. During the former act the vocal cords diverge posteriorly, while during phonation they acquire a parallel position, which is effected by the approximation of the anterior part of the cricoid cartilage and a corresponding depression of the arytenoid, and posterior part of the cricoid cartilages. This indication of the approximation of the cricoid to the thyroid cartilage from the contraction of the cricothyroid muscle is also to be perceived by palpation, and is the more perceptible to the finger the higher the tone. As in the appellations of muscles it is customary that the term of the origin is prefixed to that of the insertion, the name of *musculi thyreo-cricoideus* is, in accordance with this usage, substituted by Juarasz for that of *musculi cricothyroideus*.

ARTERIES.

Branches of the Aortic Arch.—F. G. Parsons,² discussing the determining causes of the various arrangements in the mammalia of the great trunks arising from the arch of the aorta, deduces from an extensive number of dissections that, in general, nearness of kin is not a factor in this determination of the arrangement of the branches, and also that individual variations are of the most frequent occurrence. Notwithstanding this wide range of variation, there is, however, usually a tendency toward an ideal with which the different members of the same order tend to conform. In the chiroptera the symmetric bi-innominate arrangement predominates and is constant, while the insectivora, pinnipedia, and monotremata resemble man in their similarity of arrangement. The most common mammalian arrangement is that which may be conveniently referred to as "man's commonest abnormality," so far as the aorta is concerned, in which the left carotid artery arises from the base of

¹ Arch. f. Laryngol., xii, 1, 1901. ² Jour. Anat. and Physiol., xxxvi, iv, 1902.

the innominate. From this plan the variations range in two directions, either toward concentration or separation of the branches. The first stage toward concentration is evidenced in the greater number of carnivora in which the left carotid is united with the innominate for more than half the length of the latter vessel. In the next stage of concentration, as found in the felidæ and in some of the ungulata and marsupiala, the left carotid arises from the innominate subsequent to the subclavian, so that a bi-carotid trunk exists for a variable distance beyond the innominate proper. The highest degree of concentration is normal in the ungulata, and exceptional in the primates, carnivora, and rodentia, consisting of a further fusion of the left subclavian with the innominate. In the class of separation the first stage is represented in "man's normal arrangement"; it is very common throughout the mammalia, and in point of frequency is almost equal to "man's commonest abnormality." The next degree of separation, not very often mentioned, is that in which the left carotid arises from the aorta as near the left subclavian or nearer than it is to the innominate. The third or furthest degree of separation, in which all branches arise separately from the aortic arch, is extremely rare. Other arrangements distinct from the foregoing are to be classed under the head of separation of trunks. These include those instances in which the left carotid is so far separated from the origin of the right innominate that it fuses with the left subclavian to form a left innominate trunk (cheiroptera and certain insectivora and cetacea), and also those in which the two carotids arise by a common stem from the aorta with a subclavian on each side. In these lower mammals the variation occasionally found in man of the vertebral arising from the aortic arch, or of the right subclavian being the last branch to issue from it, was never observed. These are, therefore, to be considered as progressive variations associated with the changed conditions in man which in the course of time may or may not become more frequent. In fact of the consideration of the great physical changes which of necessity resulted in the circulation, from the erect position, the similarity of the blood-vessels in man to those of other mammals is greatly surprising. The immediate causes which produce the different arrangements of the aortic branches in mammals are: (1) the breadth of the anterior part of the thorax, and (2) the position of the arch itself. Concerning the first of these causes, it is stated that separation is associated with an increased breadth of the thorax, while in the thoraces compressed from side to side the aortic branches are more liable to be fused. As to the position of the arch itself, the supposition appears strong that the nearer the arch is to the thoracic outlet, the more likely are the branches to be separated. Whether the commonest abnormality of man is to be regarded as a reversionary variation, or whether it is the effect of the causes mentioned, cannot be definitely stated. To ascertain this it is suggested that in the occurrences of this abnormality the following be noted: (1) whether the transverse diameter of the outlet and upper part of the thorax is diminished, and (2) whether the aortic arch is lower (more caudal) in position than it usually is. With a negative finding in these results the abnor-

mality would be regarded as an instance of reversionary variation, but, as already stated, other common human abnormalities are not attached with such significance.

A rare anomaly of the aortic arch, remarkable for the series of branches arising from it, is recorded by S. Taylor.¹ The innominate and left common carotid arteries arose from their respective normal position, but a small thyroidea ima and a minute thymic branch arose from the former before its division. Between the left carotid and left subclavian the left inferior thyroid artery arose independently from the aortic arch, its plane of origin being slightly posterior to that of the contiguous large branches. From a bulbous enlargement 8 mm. in diameter, situated anterior to and at the root of the left subclavian, a large trunk arose which ascended in front of the left subclavian to the medial margin of the scalenus anticus. At this point it gave off (1) the internal mammary which descended in its normal position to the thorax, (2) the superficial cervical branch, (3) the posterior scapular, and (4) suprascapular, all these branches crossing over the scalenus anticus and proceeding to their several destinations in the usual fashion. An additional feature of interest in this subject was that the vertebral column consisted of 7 cervical, 11 thoracic, 5 lumbar, 6 sacral, and 3 coccygeal vertebræ.

S. Cameron² reports a case of a rare occurrence representing an atrophy of the fourth left aortic arch with persistence of the right and left aortic roots. In the subject of this irregularity, an adult male, the aorta passed behind the sternum and crossed the trachea, arching over the right bronchus, and, after reaching the level of the second dorsal vertebra on the right side, descended for the most part in the right posterior mediastinum. The descending portion of its course was, however, not direct, for after reaching the seventh dorsal vertebra it described a curve with a convexity to the right, which terminated at a point at about the interval of the twelfth dorsal and first lumbar vertebræ, where it again assumed a median position. Its main arterial trunks were given off in the following order: (1) left common carotid, (2) right common carotid, (3) right subclavian, (4) left subclavian, the innominate artery being totally absent. The left subclavian artery arose from a pouch-like process projecting from the left side of the descending aorta, which pouch measured 1.5 cm. in length, and equaled a normal common iliac in diameter. The ductus arteriosus, which was of large size and 4 cm. in length, was also joined to this pouch.

Arterial Supply of Celiac Ganglion.—The solar or celiac ganglion of the sympathetic nervous system receives its vascular supply, as known, from arteries which arise directly from the abdominal aorta. D'Evant³ describes these branches in detail, stating that there are 4 segmental branches of the abdominal aorta on each side which supply this ganglion. The upper of these branches is termed *ramulus cœliacus s. solaris*, and it is said to be also present in other mammals, viz., in the ruminants, solipedes, and pachyderms.

¹ Jour. Anat. and Physiol., xxxvi, Pt. III, 1902.

² Lancet, Sept. 6, 1902.

³ Monit. zoolog. ital., xi, 10.

VISCERA.

Sebaceous Glands in Buccal Cavity.—P. Zander,¹ from a systematically conducted examination of 450 persons for the determination of the exact occurrence of the sebaceous glands in the buccal cavity, reports them to have been frequently observed, especially when irritations of the mucosa or carious teeth were present. Rudimentary hairs were, however, not found. The glands when present are said to have their origin in an infolding of the epithelium, their position corresponding with that of the hairy zones (*Haarstreifen*) which are found in certain of the rodentia, the beaver, rabbit, etc.

Absence of Esophagus.—The condition of complete absence of the esophagus has, according to J. P. Marsh,² been recorded but 4 times. To these is added an additional case of his own observation, which was noted in a male child which died 5 days after birth from rapid emaciation, no nourishment administered by the mouth having been retained. At the autopsy all the viscera, with the exception of the esophagus, were in a normal condition. This structure ended blindly at the level of the supra-sternal notch. To the stomach was attached an esophageal termination of normal caliber which extended as far as the diaphragm and ended blindly at this point. Between these two blind ends a few very fine fibrous bands were to be traced. This space, 2 inches in length, represented the portion of the esophagus absent.

Fundus of Stomach.—When considered from its developmental nature, the fundus of the stomach, as stated by A. Keith and F. W. Jones,³ is not a general expansion of the gastric portion of the foregut, but a localized outgrowth, or diverticulum, from the cardiac end of the greater curvature, which in its manner of origin has much in common with the diverticulum which gives rise to the cecum and appendix cæci. The cardiac diverticulum is most evident at the third and fourth months, subsequent to which is it less distinctly demarcated, expanding and merging with the body of the stomach. The apex of this outgrowth is usually of conical shape and is directed against the left dome of the diaphragm. It arises chiefly from the left side of the dorsal mesogastrium (gastrophrenic ligament and gastrosplenic omentum), its attachment being thereby placed on the right (posterior) aspect of the fundus. The development of this portion of the stomach elucidates the peculiar arrangement of its muscular coat, for, as known, the longitudinal muscular layer is lost here after being obliquely drawn over in this direction, while the fibers of the circular muscularis are practically confined to the fundus and are arranged in a circular manner around it with the central whorls commencing at the apex of the outgrowth.

Unusual Length of Appendix.—An appendix cæci remarkable for its length is described by R. S. Trevor.⁴ This specimen, which when

¹ Monats. f. prakt. Dermat., xxxii, No. 3.

² Am. Jour. Med. Sci., cxxiv, 1902, 252.

³ Jour. Anat. and Physiol., xxxvi, Pt. III, 1902.

⁴ Proc. Anat. Soc. Great Brit. and Ireland, Feb., 1902.

straightened out, but not stretched, measured $9\frac{1}{2}$ inches, had the appearance of a cord. It had a retroperitoneal situation, being directed upward posterior to the cecum and ascending colon, and was entirely inclosed in a canal or fibrous sheath. The inclosure of the appendix in the fibrous sheath appears most remarkable; it withheld this structure from view until after a more extensive dissection. To the naked eye the appendix appeared healthy, there being no signs of inflammation around any part of its course, and there was, furthermore, no evidence of a meso-appendix, as might have been the case had the fibrous canal inclosing it been an ileocecal pouch inclosed by adhesions.

Position, etc., of Appendix.—From the reports of 1400 autopsies, Monks and Bapst¹ tabulate the anatomic findings on the appendix cæci. Of this number the appendix bore no etiologic relation to the cause of death in 656 cases, which consequently are alone considered. In 641 cases in which the length was reported this was found to average 7.9 cm., with the extremes of 24 cm. and 1 cm. In 277 cases the mesoappendix was mentioned, it having been totally absent in 6.5 %. In 64.6 % it practically extended along the entire length of the appendix, in 8.5 % for over half its length, and in 3.7 % it extended for less than half the length. The position or direction which was recorded in 572 cases was most commonly toward the pelvis, the appendix frequently hanging over the brim. The second most common position was that posterior to the cecum, the third "down" and the fourth "in." In three-fourths of all the cases the appendix had assumed one of these four positions.

Anomaly of Hepatic Ducts.—A rare anomaly of the hepatic ducts, in which the gall-bladder was situated beneath the right lobe of the liver internally to and about 6 cm. from the ligamentum teres, is mentioned by Kehr.² The cystic duct terminated in the narrow hepatic duct, which lay on the distended portal vein, and in this position coursed in an oblique direction from above downward. Close to the duodenum the right and left hepatic ducts united; the latter being of normal size, about twice that of the left duct.

Secondary Spleens.—Haberer³ distinguishes various forms of secondary spleens (*Nebenmilzen*), among which the *lienes succentariati* are held to be constricted portions of the main organ, derived not only from the *margus crenatus*, but also from the *margo obtusus*. The *lienes accessori*, on the other hand, are more or less distant from the splenic borders, being found especially about the hilum in the *ligamenta gastro-lienale*, *gastrocolicum*, in the great omentum, and microscopically also in the pancreas. About the hilum of the spleen these accessory organs are situated on the branches of the splenic artery, and their distinction from lymph-glands can only be microscopically determined.

Lobulated Spleen.—Th. Fürst⁴ records the rare instance occurring in a newborn, of a lobulated spleen in which the lobes, 5 in number, were for the greater part distinct and completely divided. This group of

¹ Boston M. and S. Jour., CXLVII, 1902, 589.

² Münch. med. Woch., Feb. 11, 1902.

⁴ Anat. Anz., Bd. XXI, Nos. 16, 17, 1902.

³ Arch. f. Anat., II. 1, 1902.

splenic lobes which were approximately of equal size, and of a spherical to a bean-like form, with a stronger convex and lesser concave surface, was found in the mesogastrium, and in their totality resembled the shape of the normal spleen. Each lobe possessed a hilum on its concave surface, a separate vessel passing to each of these organs from a point situated at about the center of the group. Between only two of the lobes was a connection, by a narrow bridge of tissue, to be found, the nature of which, whether fibrous or parenchymatous, could not be macroscopically determined. Etiologically this aberration is not considered to be the product of any secondary constricting process arising from mechanical effects, but it is thought that the failure in the concentration of the splenic anlage, which in its primitive state is diffuse, is the determining factor of such an occurrence.

Pelvic Peritoneum.—Dixon and Birmingham,¹ in an account of the various projections and ridges of the pelvic peritoneum, which are formed by its contained structures, bladder, ureter, vas deferens, etc., divide this cavity into 3 primary districts or fossæ which are morphologically equivalent in the two sexes, and which from their superficial resemblance, may be compared to the great fossæ of the base of the cranium. These fossæ are the anterior or vesical, the middle or genital, and the posterior or rectal. The anterior primary fossa is separated from the middle on each side by a peritoneal fold, corresponding in position to the ureter, and coursing downward and inward to the lateral angle of the bladder. Between these folds it is bounded by the posterior border of the bladder. This fossa is subdivided into 3 portions, a median convex triangular area corresponding to the upper surface of the bladder, and on each side of this an elongated depression extending from the lateral border of the bladder internally, to the horizontal portion of the vas deferens laterally. This lateral subdivision of the vesical fossa, termed the paravesical fossa, is invaded by the bladder when this organ is distended, and is thereby reduced to a mere slit or fissure. More external to this, along the lateral wall of the pelvis, and above the vas deferens, is the fossa obturatoria, which is bounded anteriorly by the external iliac vein, and posteriorly by the ureter. In the posterior part of this fossa obturatoria is situated the fossa ovarica of the female. The middle primary fossa, which is related to the terminal portions of the genital ducts, the vasa deferentia and seminal vesicles in the male, and uterus in the female, is separated from the posterior fossa by the sacrogenital folds. Within this fossa, between the bladder in front and the seminal vessels posteriorly, there is often present a slight depression, well marked in the embryo, which corresponds to the uterovesical pouch of the female. The term genitovesical pouch is suggested for those corresponding parts in both sexes. The posterior primary fossa presents a central area corresponding to the rectum, at each side of which is an elongated depression—the pararectal fossa. This latter is invaded by the rectum during distention. Inferiorly, as the rectum sinks down to pierce the pelvic floor, the two pararectal fossa become continuous in front, and this lower part of the posterior primary

¹ Jour. Anat. and Physiol., xxxvi, Pt. II, 1902.

fossa is known in the female as Douglas's pouch. In accordance with its position in both sexes,—between the rectum posteriorly and the genital ducts, vasa deferentia and seminal vesicles or cervix uteri anteriorly,—the term “rectogenital pouch or fossa” is suggested.

Accessory lungs which have no connection with the lungs proper, G. Herxheimer¹ states to be a very rare occurrence, he being able to collect but 3 cases, all of which were nonfunctionating, and lay between the left lung and diaphragm with no bronchial or tracheal connection. In an autopsy of a male child 3 weeks old in which death had occurred from pressure (tracheal stenosis) he himself observed such an accessory organ, situated above the right lung. It was the size of a bean, hard in consistence, containing no air, grayish-red in color, and bore a marked resemblance to a lymph-gland. A bronchus leading from the trachea to this accessory organ established a direct communication between these two organs, while the left normal bronchus bifurcated into two branches supplying the two normal lungs, both of which were involved in a lobular pneumonic process. Microscopically it was determined that this bean-like tumor consisted of well-developed pulmonary parenchyma, which was also involved in the pneumonic process. It is assumed that the enlargement of the accessory lung, caused by the pneumonia, produced a pressure on the bronchus supplying the two normal lungs from which the stenotic tracheal symptoms resulted.

Elastic Fibers of Lung.—P. Bonheim,² in an examination including 24 fetuses from 4 cm. in length to the last stages of the fetal period, and also several children a few months of age, studied the elastic fibers in the lung. He found that the development of these fibers begins in the fetus at the third month, and is completed at birth. They appear in the following order: vessels, cartilage, and large bronchi, medium-sized bronchi, pleura, small bronchi, and alveoli. By the arrangement and strength of these elastic elements it is said a proximate idea as to the age of the fetus may be gained.

Bronchial Glands.—The bronchial glands have been investigated by C. Bonne³ in a number of mammals and in man. They were found to be numerous in the ruminantia, less abundant in man and dogs, and sparse in the rodentia. The epithelial cells of these acinous glands which secrete an albuminous secretion have a granular appearance. Serous, mucous, and also an intermediate type of cells are said to exist in these acini.

Parathyroids.—In a detailed study of the parathyroid glands of a historic, experimental, embryologic, anatomic, and pathologic nature, C. E. Benjamin⁴ concludes that these organs have a separate anlage which in mammals is to be found in the fourth branchial cleft. The parathyroid glands are constant in their occurrence, paired structures and usually bilateral, being found within certain limits in definite positions. From the earliest stages their structure differs from that of the thyroid gland, and in the regressive and progressive alterations of the latter organ the

¹ Centralbl. f. allg. Path. u. path. Anat. xii, 13, 529, 1901.

² Mitt. a. d. Hamb. Staatkrankenst., iii, 4, 625.

³ Bibl. anat., ix, 3, 97.

⁴ Beitr. z. path. Anat. u. allg. Path., xxxi, 143, 1902.

parathyroid glands remain normal. Their physiologic importance in animals is as yet unknown, and though a functional association with the thyroid gland cannot be altogether excluded, it is more probable that it is functionally independent of this organ. Pathologically they may be the origin of malignant neoplasms.

Interscapular Gland.—Shinkishi Hatai¹ describes a gland in the human embryo which, in its position, general appearance, and to some extent also in its structure, corresponds to the hibernating glands of the lower animals. This gland, which is termed the interscapular gland (*glandula interscapularis*), is a long, narrow, and paired organ, variable in its size according to the size of the embryo, and may conveniently be divided into two parts—an anterior enlarged or superior, and a posterior narrower or inferior portion. The former part begins immediately below the parotid gland beneath the sternocleidomastoid and proceeds downward and slightly dorsally in the space between the internal jugular vein and the levator scapulæ and splenius capitis muscles. Upon reaching the superior border of the scapula the anterior half of the gland enlarges, forming a triangular shaped mass, the basal line of which lies along this border. In this portion of its course it is covered by the trapezius. The inferior portion of the interscapular gland proceeds from the basal line in a caudal direction beneath the scapula or along its vertebral border, being also covered by the subscapularis or trapezius. Structurally this gland is composed of polygonal lobules which in the anterior half resemble those of the parotid gland, while in its posterior portion, owing to the confined space, the lobules are flattened and arranged in such a way that the base of one lobule is overlapped by the free edges of the other. The gland is composed of two entirely different constituent tissues, an outer fat tissue, and an inner lymphoid structure, the latter completely surrounding the former. The lymphoid tissue is composed of lymphatic nodules of an adenoid nature, each surrounded by a thick fibrous capsule which is derived from the thin fibrous capsule which invests the entire gland. Each nodule, or at times several in conjunction, are in turn again surrounded by the fat tissue, and in some cases the lymphoid structure and the fat tissue are found in the same fibrous capsule. This organ, of which no trace persists in the adult, has no anatomic connection with the thymus gland. From its relative position as well as its fatty structure the gland may be classified as a hibernating gland, but the presence of the lymphoid structure, which is of greater importance than the fatty part, more strongly favors its interpretation as a cervical hemolymph gland. For the definite solution of this problem, however, a further and more detailed investigation is indicated.

NERVOUS SYSTEM.

Weight of Cerebral Hemispheres.—C. Winkler² determined that the weight of the left and right cerebral hemispheres, when compared to each other on 50 males and females, each was equal. The weight of the

¹ Anat. Anz., Bd. xxi, No. 14, 1902.

² Petrus Camper Deel., i, Afl. ii.

insulæ and their surrounding gyri, however, differed on both sides. The left insulæ and the male insulæ with their surrounding convolutions were, as compared with the whole cerebral hemisphere, relatively heavier than the right insulæ and the female insulæ with their surrounding gyri.

In an examination of 716 male and 457 female brains relative to their weights F. F. Marchand¹ reports an average of 1400 gm. in the former, and of 1275 gm. in the latter. The increase in weight after the fifteenth year is stated to be small, while after the nineteenth to the twentieth years in males, and after the sixteenth to the eighteenth years in females, it totally ceases. It is probable that the cerebral weight increases with the body-growth, but an approximate proportion between the two could not be determined. Assurance is given, however, that in women the lesser cerebral weight is not dependent on the small body-size, as the mean weight of the cerebral organ in females is without exception less than that of men of the same size. The deduction is therefore made that this lesser weight of the brain in women is an expression of a difference of organization of this sex. The cerebral weight in the two sexes was found to be as follows:

MALES.	FEMALES.
In 50 % 1300-1450 gm.	In 55 % 1200-1350 gm.
In 30 % more than..... 1450 gm.	In 20 % more than..... 1350 gm.
In 20 % less than..... 1300 gm.	In 25 % less than..... 1200 gm.
In 84 % 1250-1500 gm.	In 91 % 1100-1450 gm.

Island of Reil.—M. Holl's² investigations on the human insula elicits the deduction that it represents an arched convolution around the sulcus longitudinalis insulæ, which has suffered depression. Its posterior portion is smooth and narrow, its anterior portion wide, expanded, and traversed by secondary sulci and convolutions. Of these secondary sulci, the sulcus ventralis is the one which is best developed. In a further study, in which the insula of the human brain was compared with that of certain of the anthropoid and lower apes, the orang outang, chimpanzee, and macacus, the human insula was seen to consist of two portions, which in the anthropoids are more distinct: viz., an arched deeper part and a smaller superficial part, which are, however, somewhat incompletely separated by a sulcus. In man this sulcus corresponds to the sulcus brevis anterior. The sulcus fronto-orbitalis of the anthropoids represents the anterior sulcus of the human insula. In the ungulata and carnivora the form of the insula is similar to that of the anthropoids.

L. Bolk³ deduces that the insula of the human brain is not entirely homologous to that of the anthropoids. Its anterior portion is formed by a lobule which in the apes lies anterior to the sulcus centralis insulæ, and which is termed the lobulus anterior insulæ.

Hypophysis Cerebri.—W. Thom⁴ reports his investigations on a series of human hypophysis cerebri (62 in number) which were in part normal and in part pathologic. Of the former, it was ascertained that in

¹ Biol. Centralbl., Bd. xxii, 12, 1902.

² Arch. f. Anat. u. Physiol., 1902, 1.

³ Petrus Camper Deel., 1, Afl. 1, 25.

⁴ Arch. f. mikrosk. Anat. u. Entwicksgesh., LXII, 632.

the comparative measurements of the various dimensions a certain relation can be said to exist, in that a decrease in one direction was frequently associated with a relative increase in the other. The most rapid growth of this gland occurs up to the age of 30, but an increase in the volume normally persists after this age. The histologic investigation determined that its cells are mostly of the chromophilic order, being in part cyanophilic and in part eosinophilic. These are regarded as the normal cells of the hypophysis. Among other cells which are described are to be mentioned those which have heretofore been regarded as the main cells of these glands. They are found to be slightly cyanophilic, slightly eosinophilic, or altogether chromophobic. The arrangement of the cells either is tubular or cord-like, according as to whether they inclose a lumen containing a colloid substance or not. The colloid substance is, however, if at all present, sparse, so that on the basis of the active functioning appearance of the glands a secretion into the interfollicular lymph-spaces is assumed to occur. The colloid substance is furthermore divided into an interfollicular highly colorable colloid, secreted by the chromophilic cells, and into an interfollicular thin colloid secreted by the chromophobic cells.

Sulci of Spinal Cord.—J. Zappert,¹ in his investigations concerning the sulci of the spinal cord of the child, concludes from the 140 specimens examined that such sulci and depressions are frequently present, and especially in the cervical region. Along the posterior spinal tract a sulcus exists between the columns of Goll and Burdach, as also at the exit of the posterior spinal root. In the anterior tract a sulcus is found in connection with Hellwig's bundle, and along the lateral spinal tracts not infrequently an asymmetric sulcus was to be detected in the lateral cerebellar tract. This latter was definitely determined to be present in 6 children, but its detection at a later period when the lateral pyramidal tract becomes medullated is much more difficult. Whether the presence of this sulcus is to be associated with a decreased development of the lateral cerebellar tract, as has been stated by Flechsig, could not be ascertained, but it is thought probable that in the absence of this tract the aforementioned sulcus would be markedly deepened.

Cell Groups of Spinal Cord.—B. Onuf² considers the arrangement and function of the different cell groups of the sacral region of the spinal cord in man. From a detailed microscopic examination of the various sacral segments he concludes that variations of a marked character in the arrangement of the cells are to be found in the successive segments. Among these variations is to be mentioned the posteromedian group or cells of the anterior horn, which occur only in the third sacral segment and in the proximal part of the fourth. It is assumed that this group of cells innervates the bladder, rectum, and perineal muscles. In the region of the second sacral segment a group of cells may be differentiated from the anterolateral group by their smaller size. These cells are probably connected with the ischiocavernosus (corresponding to the erector clitoridis) and the bulbocavernosus (corresponding to the sphincter vaginæ).

¹ Arb. a. Prof. Obersteiners Lab., Wien, 1902, H. 8. ² Arch. of Neurol., III, 1902.

Column of Clark.—M. Schacherl,¹ in a detailed description of the posterior vesicular column of Clark, proposes that this term be applied to all the analogous structures of the spinal cord in accordance with the original intention of Clark himself. It is stated that in man this column is constant in the second cervical segment, and frequently its cells are also found in the second and third cervical segments. In the fourth segment the column is usually not to be found, but it reappears in the seventh and eighth, and becomes more distinct in the dorsal region, its increase in the proximal parts of this portion of the spinal cord being somewhat gradual, while in the inferior segment it is more rapid. The greatest development of the column of Clark is attained between the twelfth dorsal and the first lumbar segment, after which it again rapidly diminishes in size, being completely lost at the level of the third lumbar segment, but again reappearing in the interval of the second and third sacral segment. In the fourth sacral segment this column is again very distinct. The size of Clark's column is stated to be very variable, there being cords in which no interruptions are to be detected. In the upper cervical region the posterior vesicular columns are situated about the middle of the base of the posterior horn. As it increases in size, however, to the point of its greatest development it moves in a posterior direction, so that in these regions it protrudes into the posterior spinal columns, forming the protuberantia cornus posterioris medialis. From the point of its greatest development it again recedes in an anterior direction as it proceeds downward. In animals variations as to class, order, and species are frequent. In the birds it reaches its greatest development, and especially in the enlargements of the spinal cord. In the dolphin it is continuous from the inferior region to the upper lumbar cord. In the sheep, and probably also in the horse, the posterior vesicular column is absent only in the enlargements. In the rabbit it is absent in the cervical enlargement and in the sacral cord, and similarly in the seal, while in the carnivora it is continuous throughout the entire spinal cord, etc. The cells and fibers, both afferent and efferent, of this column are furthermore fully described, for which, however, reference must be had to the original.

Ganglion Cells of Nucleus Trigemini.—A. Bickel,² definitely to determine the question as to whether the ganglion cells of the accessory trigeminus nucleus are unipolar or bipolar, reports his investigations on adult rabbits. In sections stained with the methylene-blue method of Krause only one axis-cylinder process arising from the vesicular shaped cells peculiar to this nucleus could be detected. Multipolar cells were also found in immediate relation with these cells of the accessory trigeminal nucleus, whose axis-cylinder processes, however, had no apparent connection with the descending trigeminal root in which all the axis-cylinder processes of the vesicular shaped cells were contained. From the axis-cylinder processes of the unipolar cells collaterals arose a short distance from the nucleus.

Fat Pigment in Ganglion Cells.—M. Mühlmann³ corrects his pre-

¹ Arb. a. Prof. Obersteiners. Lab., 1902, Wien, H. 8.

² Arch. f. mikrosk. Anat., LIX, 270.

³ Arch. f. mikrosk. Anat., LVIII, 231.

vious statement that the fat pigment in the ganglion cells appears at about the age of puberty. In further investigation on this subject it was observed that the pigmented fat-bodies in the nerve-cells were present in the first year. They are at first diffused throughout the cell, but gradually accumulate, until in old age the great majority of the ganglion cells in the central nervous system are filled with this pigment. In this process, termed fat-pigment metamorphosis, the protoplasm of the cells disappears, it being replaced by the pigment in question. This replacement of the protoplasm by fat-pigment is a normal process and has no pathologic significance; it occurs not only in man, but also in the higher mammalia. No impairment in function at first results therefrom, as the remaining protoplasm of the nerve-cell can functionally compensate for the loss in volume. Not till the metamorphosis has reached vast dimensions, as in old age, is a deficiency in function apparent. When it affects the vital centers of the medulla, death ensues.

Laryngeal Nerves.—A. Onodi¹ asserts that the connections of the laryngeal nerves with the sympathetic and the *nervi cardiaci* is much more intimate than is generally supposed. Recent observations and his own investigations have shown that in man the external branch of the superior laryngeal nerve sends off a distinct cardiac branch or connection to the upper cervical ganglion of the sympathetic and to the upper cardiac nerve. The connection between the nerves just mentioned is an exact analogue to the depressor nerve found in animals. In the horse the writer has succeeded in giving the anatomic proof that the respiratory and phonatory bundles of the inferior laryngeal nerve run separately both in this nerve and in the pneumogastric, having demonstrated their separate course for a distance of 88 cm. The phonatory bundle was found to be much more easily isolated and to have but one connection each with the *ansa vieussenii* and with the cardiac branch, while the respiratory bundle was isolated with more difficulty, owing to its intimate connections of 8 branches with the sympathetic and cardiac branches. These investigations have also disclosed the fact that the *rami communicantes* of the sympathetic are arranged according to a well-defined system. In the upper part of the thorax and in the neck the greater portion of the cerebrospinal fibers run upward and only a small portion downward, while in the rest of the thorax and in the abdomen the reverse is the case.

Innervation of Depressor Labii Inferioris.—M. Jaffe,² who writes of several cases of isolated paralysis of the depressor labii inferioris resulting from operative incisions along the neck, describes the innervation of this muscle in full. In his investigations he found that this muscle derives the fibers of its nervous supply from a branch which arises from the *ramus colli* of the facial. This branch, for which the name of "*ramus anastomoticus collo-mandibularis*" is suggested, enters the face in conjunction with the facial artery to anastomose with the mandibular branch of the seventh nerve, its fibers then proceeding to the *quadratus menti*. The point of origin of this nerve as well as the site of its anastomosis with the mandibular branch is variable, and several forms of these variations

¹ Brit. Med. Jour., Aug. 30, 1902.

² Arch. f. klin. Chir., LXVII, 3, 736.

are figured in the article. Its division can be avoided during operations, however, by placing the incision in a line extending from the mastoid process to a point slightly external to the great cornu of the hyoid bone. In operations in the submental region it is advised that the incision be begun about 0.75 cm. anterior to the entrance of the facial artery in the face. Clinically the paralysis of this muscle from the division of the nerve shows itself in the failure to depress the lower lip on the affected side during the opening of the mouth. During laughing, also, the facial expression is markedly disturbed.

Lumbosacral Plexus.—P. Aurel and L. Spencert,¹ in an investigation of the plexus lumbosacralis in 44 males and 20 females, noted the following variations: A normal plexus was found in 25 males, and 5 females; a plexus with 4 roots in 83.7 % of males and 55 % of females; a plexus with 5 roots in 11.3 % of males and 45 % of females; a plexus with 6 roots in 6.8 % of males. In 6.2 % an accessory obturator nerve was found and a nervus furcalis at the fourth lumbar vertebra was frequently present.

Nerve-endings.—Grabower,² in his investigations on the muscular nerve-endings in the human beings, obtained results similar to those of Kühne, Krause, and others, on the reptiles and amphibia. The muscles of the larynx, which were employed in this research, showed various forms of terminal nerve-endings: viz., terminal plates (*Endkolben*), networks and also simpler forms, and lastly a form which bears a marked resemblance to Meissner's corpuscles. The last of these consists of an oval body in the interior of which nuclei are placed transversely to its long axis and in which numerous fine granules are found. A nonmedullated or slightly medullated nerve-fiber is connected with these oval bodies, which it is believed might be of a sensory character. All of the terminal nerve-endings are hypolemmal, the sheath of Henle being continuous with the sarcolemma. Anastomosis of the terminal nerve-endings with each other, the entrance of a medullated nerve-fiber into the same terminal nerve-ending, and the presence of two nerve-endings into the same muscle-fiber were also observed.

GENITOURINARY TRACT.

Suprarenal Gland.—An occurrence of suprarenal gland in the ligamentum hepato-duodenale is reported by H. Eggeling.³ This organ, which was invested by peritoneum, lay along the posterior surface of the ligament, anterior to the foramen Winslowi, being 54 mm. long and 19 mm. in its greatest width. Its upper extremity extended to the porta and its middle lay at about the level of the junction of the gall-bladder with the cystic duct. The macroscopic structure and central pigmentation characterized it as a typical suprarenal gland. The right adrenal lay in its normal position; the fate of the left normal organ, however, remained in doubt, as it had not been timely determined. It is probable, however,

¹ Bibliog. Anat., I, IX, 4, 209.

² Arch. f. mikrosk. Anat., LX, 1

³ Anat. Anz., Bd. XXI, No. 1, 1902.

that the organ described represented a misplacement of the left suprarenal gland into the ventral mesentery of the cephalic portion of the mid-gut. As the reason for this abnormal position is advanced a downward retroperitoneal migration to the upper horizontal limb of the duodenum, which at this time must have been already fixed to the posterior abdominal wall. After reaching this point the migration subsequently continued in a cephalad direction within the dorsal portion of the ventral mesoduodenum.

Ureter.—The spindle-shaped dilations and tortuosities of the fetal ureter, which have been alluded to by a few anatomists in a desultory way, are more concisely described by C. A. Hamann,¹ who, from their almost constant presence, regards them as normal in the fetus. In 13 fetuses varying from the age of 7 to 9 months the ureters presented more or less distinct dilations in all but 2 cases. These dilations were found near the point of intercrossing with the iliac vessels, at which point the ureter was narrowed and bent upon itself, a flattened enlargement 1.5 to 2.5 cm. in length preceding this constriction. In width they exceeded the diameter of the ureter $1\frac{1}{2}$ to $2\frac{1}{2}$ times. As to the tortuosities of the ureter, they were evident in all but 4 cases, and are said to have been more frequent in the younger fetuses. These curves were either long and serpentine, or tortuous and spirally curved, and occasionally from 2 to 4 corkscrew turns near the kidney were present. With the growth in length of the body, these curves and tortuosities disappear, as they are absent in the adult. It is assumed that in certain cases they may favor the development of hydronephrosis. The dilations of the ureter just above the pelvic brim probably result from the obstruction to the escape of the urine due to the narrowing and the curve of the ureter as it crosses the iliac vessels.

Vesical Mucosa.—As stated by A. Lendorf,² the vesical mucosa of man and the mammalia has but two layers: a superficial layer of markedly flattened epithelium, and a deeper stratum in which the cells are extended lengthwise during the contraction of the bladder, and from which the deceptive appearance of 4 layers is derived. Around the orificium urethræ internum in the trigone and in the fundus, simple tubular glands or crypts occur. These glands or crypts secrete a hyaline substance which stains red with acid fuchsin, and a slight grayish-blue with the hematoxylin. Among the nerve-fibers, ganglion cells are found, and the terminal fibers of these nerves terminate in small light bodies, about one-half the size of the nuclei of the epithelial cells and in part superficially in the tissues of the mucosa.

Seminal Vesicles.—Akutsu,³ from a histologic study of the seminal vesicles in which 66 specimens were examined, reaches the following conclusions: (1) The muscularis consists usually of two layers, an outer longitudinal and an inner circular. Exceptionally an inner longitudinal stratum of muscular fibers more or less complete may also exist. (2) The epithelial cells which are arranged in one layer are either of a cylindric or

¹ Jour. Med. Research, VIII, 1, 125.

² Anat. Hefte, XII, 1, 55.

³ Arch. f. path. Anat. u. Physiol., CLXVIII, 3, 467.

cubical shape. In newborn infants and children the high cylindric variety always prevails, while in adults after the twentieth year it varies between a distinct cylindric and a very low flat form, the cubical form being, however, most frequently found. In the distended state of this organ the epithelium suffers a diminution in height, which diminution may be either due to the mechanical pressure or to the secretory process itself. (3) No special glands exist in the seminal vesicles, the epithelial cells assuming the secretory functions themselves. The main production of this secretion probably occurs at a certain phase, viz., during sexual excitement, during which the total number of cells are not simultaneously active, but secrete at various times. (4) Elastic fibers occur especially in the connective tissue and subepithelial layers; in the muscular coats but very few, if the vessels be excluded, are found. In the newborn they are totally absent, but they increase in number and size, although slowly, to the thirtieth year. In old age atrophy of the elastic tissue is not very apparent. (5) A deposition of pigment in the various coats of the seminal vesicles, the mucosa muscularis, and connective-tissue layer occurs physiologically after the age of puberty and increases thereafter with age. This pigment is a metabolic product, and is to be classed among the lipochromes. The quantity and size of its granules vary, and its difference in the various coats is, however, partly dependent on such influences as age and disease.

Ejaculatory Ducts.—W. Felix¹ gives a detailed description of the ejaculatory ducts, whose average length he states to be 19 mm. True tubular glands which may contain a yellow pigment exist not only in the mucosa, but also in the muscularis into which coat these glands extend. Glandular structures are, moreover, also found in the pars ampullaris, ductus deferens, and vesicula seminalis.

Development of Prostate and Seminal Vesicles.—As determined by G. Pallin,² the development of the human prostate gland and seminal vesicles occurs about the third month of embryonic life. The prostate gland owes its origin to a constriction of 3 groups of solid longitudinal folds from the external wall of the urethra, two of which are situated dorsally, cephalad and caudad, and one ventral to the genital chord. The main portion of the basis prostatae is formed from the cranial anlage, while the so-termed lobus tertius arises from the branching of the cranial glands. The dorsal caudal anlage gives origin to the lateral and posterior portions of the lateral lobes, and the ventral anlages occupy the space anterior to the urethra; their number, however, at about the fourth month suffers a diminution, and they then form an anterior lobe which may experience a total atrophy. In the female the glands along the inferior portion of the urethra are the only indication of a homologue of the prostate gland. These are formed from the cranial anlage. The seminal vesicles, which also arise at about the third month, have their origin in longitudinal hollow folds, constrictions of the wolffian ducts. The diverticula of the vesicles are developed in the fourth month. The most simple type of the adult seminal vesicles, which in their form are

¹ Anat. Hefte, Abth. 1, Bd. XII. ² Arch. f. Anat. u. Physiol., 2 and 3, p. 135, 1901.

subject to numerous individual variations, is that which most closely resembles the embryonic structure in which the main channel is but slightly curved and the diverticula not well developed.

Hydatids of Morgagni.—J. H. Watson,¹ in dealing with the origin and nature of the hydatids of Morgagni, states that the sessile hydatid of the testicle is much more frequently present than the pedunculated hydatid. The former is a firm fleshy body and not transparent and bladder-like. It is fixed by a broad base to the upper pole of the testicle, the caput epididymis overlying it slightly, and a connection in the form of a band of tissue, over which the visceral tunica vaginalis is raised as a fold, is often to be observed between the two. The general statement as to the Müllerian origin of the sessile hydatid is undoubtedly correct, for by the aid of microscopic sections it was possible to determine the remnant of the Müllerian ducts in male fetuses and children, and even to trace it along the anterior and outer border of the epididymis and into the hydatid itself. The younger the testicle, the more obvious the solitary tube in the epididymis appeared, but with increasing age the evidences of the Müllerian duct were more difficult to see. The pedunculated hydatid of the male, which is only exceptionally present, is of variable dimensions, and is attached by a short pedicle to the apex of the caput epididymis, or, roughly speaking, to the upper end of the wolffian duct, a position identical with that of the hyatid body of the female, which is attached to the anterior layer of the mesosalpinx in continuity with the collecting tubule (wolffian duct proper of the parovarium). In the female in 50 % of all cases examined the hyatid had no connection with any of the fimbrias of the fallopian tube. Occasionally, however, such a connection was found to exist. The hyatid cyst in the female assumes many forms, appearing either as a unilocular sac, as a cyst partially constricted into two portions, or a couple of separate cysts may exist. In size it increases slowly up to puberty, attaining the dimensions of a pea or even a cherry. In old age it has markedly decreased, and may in some instances even have shriveled away. A cyst quite as common as the hyatid of Morgagni, which is frequently mistaken for the latter, appears at the base of the fimbria ovarica. This cyst is of a doubtful origin, although most probably derived from a distended mucous gland, or from a cyst of the tuboparovarian duct. As to the origin of the hydatids of Morgagni, Watson inclines to the view that the pedunculated bodies in the male and female are identical, and that they are the remains of the ampullated extremity of the wolffian duct, and therefore not of pronephric origin.

Accessory Canals in the Penis.—R. Paschkis,² from an extensive examination of accessory canals of the penis in several hundred cadavers, reports the occurrence of this anomaly in but 12 cases. As compared to the cases so far reported in the literature of the subject, this number is said to be small, but this difference the writer attempts to minimize with the explanation that in the dead subject the fine slits and orifices of these canals must frequently escape observation, as they are often bridged over

¹ Jour. Anat. and Physiol., xxxvi, Pt. 2, 1902.

² Arch. f. Dermat. u. Syph., lx, H. 3, 1902, 323.

by folds, or are otherwise obliterated. From his own observations, conjoined with the cases reviewed in the literature, the following classification of these canals, based on an anatomico-histologic basis, is advanced: (1) Crypts or recesses of the integument, of varying depth and which are lined throughout their extent by typical tegumentary epithelium inclusive of the stratum corneum. (2) Irregular sebaceous glands whose excretory duct terminates free on the surface and have no connection with the hair. (3) Paraurethral canals in the strict sense of the term. Channels lined with stratified squamous, or with transitory epithelium, and in part also with glands. Developmentally as well as histologically these canals belong to the urethra. In the first of these divisions are to be classed those cases in which the presence of Tyson's glands has been mistaken for an accessory canal. The sebaceous glands also macroscopically have an appearance similar to that of these channels, and several instances are referred to by the writer in which a histologic examination disclosed the fact that these supposed canals were a sebaceous gland with its excretory duct.

SPECIAL SENSES.

Jacobson's Organs.—A case of persistence of Jacobson's organs remarkable for their length is described by M. Mangakis¹ in an adult living male. The anomaly in question consisted of a symmetric pair of complete canals, and not, as heretofore described, of blind recesses. The two canals within the nasal septum proceeded in a posterior direction, were slightly curved, and possessed two orifices each, an anterior and a posterior. The anterior orifice was plainly visible even without the aid of a rhinoscope, being situated at a distance of 1.1 cm. from the floor of the nose, and 1.3 cm. from the anterior border of the nasal septum. They were 0.5 cm. wide, and communicated with each other through an opening in the nasal septum. The posterior orifices were much narrower, 0.15 cm. in width, were located on the posterior border of the septum, and directed toward the pharynx. A catheter passed into the anterior orifice passed through the canal and protruded at the posterior opening. Several portions of the canal which were removed from different parts of its course for a microscopic examination showed that the lining membrane of these channels resembled the nasal mucosa.

Septal Deformities.—W. J. Freeman,² discussing the etiologic factor of the septal deformities of the nose, states that except the instances in which it may be attributed to traumatism or disease, it is the result of an evolutionary, or, more properly speaking, of a devolutionary change. In certain races, as the African negro, Egyptian, American Indian, and others, the external nose is a characteristic structure, which is the result of centuries of exclusion through which the purity of the race was preserved. The high or leptorrhinic nose of the dolichocephalic head necessitates a greater development of the septum than the low nose of the brachycephalic type; and in consequence of the admixture of races,

¹ Anat. Anz., Bd. XXI, Nos. 3 and 4, 1902.

² The Laryngoscope, Oct., 1901.

should the nose tend to adopt the leptorrhinic type of one parent, while the remaining facial skeleton develops the platyrrhine characters of the other parent, a deviation of the septum must follow. Broca, in his ethnologic studies, determined that in the admixture of races the nose in subsequent generations conforms in its general type to that of the predominating race. The prominent nose of the Romans was most frequently deviated, that of the American Indian most always straight. The former may be considered as having been a fast degenerating race with which many foreign elements were intermingled. In most civilized countries the mingling of the various races is great, and may be assumed to be one of the principal causes of the prevalence of septal deformities.

Cleft in Right Naris.—A somewhat peculiar anomaly, a cleft in the right naris of a child 2 years of age, is described by Kirmisson.¹ This cleft, whose general shape was that of a triangle with its base directed inferiorly, could be divided into two portions, an inferior with a height of 4 or 5 mm., and a superior straight portion of equal length which was directed toward the internal canthus of the eye. The soft parts of the base of the nose were considerably thickened and resembled a lymph-angioma, but the lobule of the nose, in contrast to this, was thin. No other concomitant malformation, such as cleft palate or harelip, was found to be present.

Median Nasal Fissure.—Nachtigall,² in a collection of 11 cases of median nasal fissure which are said to include all the cases available in the literature of this anomaly, divides this malformation into two groups, viz., those which occur simultaneously with a tumor-like formation of the two halves of the nose, and the true cleft nose of the so-called "*Doggennasen*." For the cause of this anomalous occurrence the view of Nasse is advanced, that influences of an extracranial nature, as amniotic growths and bands, produce this aberration.

Ossification of the Larynx.—Scheier³ writes in full on the ossification of the larynx, on which he made a number of observations on the living by means of the Röntgen rays. The first traces of ossification of the larynx on the human being appear at the age of from 13 to 20 years, and sometimes even earlier, or at about the time when the growth of the bony skeleton ceases. In the horse and also in the ox the ossification commences after the first year and may be totally completed at the eighth or tenth year. In the human thyroid cartilage the process of ossification is first seen in the posterior portion, in the male at the inferior cornu, from which point it extends forward along the inferior border to unite with another osseous center at the lower portion of the thyroid angle. An osseous zone next extends from the tuberculum thyroideæ inferior upward and forward so that the thyroid cartilage is divided into two portions, each of which contains a cartilaginous island which gradually increases in size until the whole of the thyroid cartilage is ossified. In the female sex the process of ossification is somewhat different. It also commences at the posterior border, but progresses in a forward and

¹ Bull. et Mem. Soc. de Chir., xxviii, 17.

² Inaug. Diss., Breslau, 1901.

³ Arch. f. mikr. Anat. u. Entw. Gesch., lxi, 220.

upward direction without involving the median portion of the thyroid cartilage, which portion nearly always remains unossified. This sexual difference, when it can be accurately and definitely determined, has a forensic importance. Eunuchs, it is said, conform with the female type of ossification. A hermaphrodite who was thought to be a female was shown from the male type of the larynx ossification to be a male. In the cricoid cartilage several centers of ossification occur, but sexual differences in its method of bony transformation were not determined. The first point of ossification presents itself in the posterior lamina; others then follow in the annulus, all of which ultimately unite. A complete ossification of the cricoid occurs more often in males. In the arytenoid cartilage ossification commences at the base, from which part it may then extend to the tip. In the tracheal rings it begins in the anterior half, and may at times involve the entire ring. In the cartilages of Santorini and in those of the epiglottis no osseous tissue was ever found. The degree of this ossification of the larynx does not determine the age of the individual. As to the internal architecture of the osseous tissue, it was shown by means of shadowgraphs of thin horizontal sections of the thyroid cartilage that the columns of spongiosa are not an irregular formation but are arranged into two distinct systems. One of these systems of columns begins at the external surface and runs tangential to the internal surface. The other system extends similar to this from the internal to the external surface, but at the thyroid angle all the columns of spongiosa are parallel to each other. By this structural formation great resistance is added during the bending of the thyroid cartilage. In the cricoid cartilage the spongiosa forms a very small fine network.

Structural Changes in the Larynx Due to Singing.—The question as to whether the function of singing effects any structural changes in the human larynx has not as yet been determined. Avellis¹ attempts to decide this on a comparative basis by observations on the syrinx of song birds. He states that in general an increased ability to sing is accompanied by a stronger and also a differential development of this organ, but exceptions to this rule are not wanting. In birds, as the parrot, in which the faculty to sing is acquired and is the direct result of training, a deficiency of the singing muscles is apparently present, while in the raven a well-developed singing organ occurs, although this bird is not a songster. The faculty to sing may, however, be cultivated in this bird. Male birds have a stronger syrinx than females, and in singing birds the muscles of the syrinx are especially well developed. The conclusion is reached that the development of the singing muscles indicates the degree of their function. This also pertains to man, although laryngoscopically it cannot be determined. The larynx of a singer is the result of cultivation of the voice, just as that of the actor, preacher, orator, etc., all of which differ from each other, although no difference is apparent in the dead organ.

Rima Glottidis.—W. A. Aikin,² from a laryngologic study concerning the separate functions of the different parts of the rima glottidis, con-

¹ Arch. f. Lar. u. Rhin., XII, H. 2.

² Jour. Anat. and Physiol., XXXVI, Pt. III, 1902, 253.

cludes that for the division of rima respiratoria and vocalis, that of rima cartilaginosa and rima ligamentosa should preferably be substituted. The rima cartilaginosa is formed by the vocal processes of the arytenoids, and is not to be called by the physiologic name of rima respiratoria, as during the ordinary breathing the whole glottis is respiratory, even though during phonation the respiratory function is accomplished through this part of the glottis alone. The rima ligamentosa is to be divided physiologically into a shorter anterior portion, which is in contact during phonation, and is therefore not free to vibrate, and a vibratory portion formed by the free margins of the ligaments. That the vibration is confined to the free margin of the ligaments is to be inferred from the fact that during the opening and closing of the glottic valve the pitch of the vocal note remains unchanged. During this vibration it is probable that the cartilaginous processes tremble, but they are not to be considered as a factor in the vibration which produces the vocal note.

Malformations of Auricle.—F. Rohrer,¹ in speaking on the relation between the formation of the anthropoid and certain congenital malformations of the human auricle, states that in man this structure is an organ which is in the state of involution and degenerative metamorphosis. As found in his examination on the relation between the function of the eye and the ear, the auricle was primarily a homologue of the eyelid, and nothing but an organ of protection for the delicate and more superficially situated parts of the middle and internal ear. At a later degree of evolution, as seen in the representatives of the solid ungula and multungula, a funnel for hearing was formed by the large development of the ear-folding, and especially by the upper parts of the helix and antihelix. The auricle of these animals, as compared to that of the monkey, shows a great difference in the direction for involution of the ear-folding on the part of the quadrumana. The development of the auricle, when compared from the hemi-simiae to the simiae, and from the latter to the anthropoid monkeys, also indicates that the involution is free from one class to the other; i. e., from the lower to the higher. Further, progressing from the quadrumana to homo sapiens, a progress in the regressive metamorphosis of the external ear is to be noted, and the nice and well-formed feminine human auricle shows that this part of the organ of hearing is by nature now more destined for elegance and beauty than for acoustic or a protective function. That the law of involution is the same for both the human and anthropoid auricle is indicated in a great quantity of anomalies of formation of the human auricle. In a large number of these a cartilaginous strip was found to extend from the crus helices ascendens through the cymba in a rectangular direction to the point of bifurcation of the truncus anthelices. This strip, which was declared a supernumerary antihelix, arose on the upper side of the tragus on the incisura supratragia, and is similar to a strip found on the ears of monkeys. Schwalbe described and designated this strip the crista anthelices anterior, whose homologue Rohrer concludes it to be, although Schwalbe stated that the crus anthelices inferior of the human auricle was the homologue of this crista

¹ Brit. Med. Jour., Aug. 30, 1902.

antheliceis anterior. This congenital anomaly is to be interpreted as a folding of the auricle in a direction from the base of the auricle to the real point of the external ear, the tuberculum Darwini. It clearly denotes that the law of involution is the same for the auricle of the anthropoids and man, and that, in consequence of regressive metamorphosis, the crista antheliceis anterior of monkeys' auricles by atavism appears as a strip in the crymba of human auricles by certain congenital malformations.

Pigment of Labyrinth.—According to an investigation by Alexander¹ as to the amount of labyrinth pigment existing in the various classes of the mammalia and in man, it is stated that this is a variable quantity. An abundance of pigment is found in the artiodactyla and rodentia, while the primates and carnivora have but small quantities. Man and the chiroptera assume a median position between these two, there being neither an abundance nor a deficiency of labyrinth pigment. As far as could be determined, the perissodactyla, insectivora, pinnipedia, and prosimia also possess but little pigment. The pigment granules always have a spherical form and are from 0.00003 to 0.003 mm. in diameter.

Retina.—Fritsch,² in a series of studies on the racial differences of the human retina as conducted on the eyes of Europeans, Soudanese, etc., and also on several monkeys, was able to distinguish 4 different forms of the fundus oculi: viz., that in which the fovea has a fine and sharp border and an even ground, that with a flat smooth fovea, not distinctly limited, that with a smooth fovea surrounded by an annular elevation of a radiating appearance (*strahlige Umwallung*), and one with an irregular fovea which frequently is surrounded by a distinct annular elevation.

Ora Serrata.—The various conflicting views concerning the development of the ora serrata, and also certain embryologic considerations of the retina, ciliary body, etc., are dealt with by Schultze.³ From his own investigations he deduces that the ora serrata in newborn infants is neither entirely absent, as stated by Schön, nor that it is present as a regular and well-developed structure, as asserted by v. Hippel. It is characterized in the fetus, newborn, and adult by a variability in its form and in its prolongations. Among its constant characteristics, as already stated by Bruecke, are its more anterior position toward the nasal than toward the temporal side, and also that its prolongations are better developed on that side. In the fourth month, in which the ciliary processes have already appeared, a sharply limited pars ciliaris retinæ cannot yet be defined. The more the elevation of the ciliary body increases with that of the ciliary processes, the more that portion of the retina which reaches to the border of the iris recedes in a posterior direction, for the reason that the ratio in growth between these two structures is not equal. In the recession of the retina a thinning of that portion of this membrane on the ciliary processes and their corresponding meridians is apt to occur,

¹ Arch. f. Mikrosk. Anat., LVIII, 1, 134.

² Sitzber. d. Preuss. Akad. d. Wissensch. z. Berl., S. 1.

³ Verhandl. d. phys. Med. Ges. z. Würzb., xxxiv, 222, 1901.

while in the sulci between these processes this thinning is not as apparent, so that thickened serrated anterior prolongations of the retina are apt to persist in the sulci between the processes. Phylogenetically, however, this indented border of the retina has no significance; it cannot be termed a rudimentary structure, as in animals a smooth retinal border is usually found.

Vascular Canals in the Vitreous.—In the vitreous body of the eye, in the vertebrate embryo, there are reported by Bertacchini¹ numerous vascular vessels upon whose surface numerous cells, structurally similar to leukocytes, adhere. As these cells traverse the vessel-wall they are to be considered derivatives of the blood. Some of these, cells however, lie free and have no connection with the vessel-wall. The ground-substance of the vitreous body at this time contains much liquid matter and but little or no mucin. At a later stage of development the number of isolated cells and the amount of mucin increase. At the time of birth, or at the time the eyelids are opened, the vessels atrophy and disappear, and on the surface of the vitreous body a layer of branched cells, with highly colorable protoplasmic granulations, is found instead. The branches of these cells become completely constricted from the main body, and are probably the main formative factor of the mucin, while the watery portion of the vitreous body is formed from the aforementioned hyaline spheres.

Lymphatics of Eyelid.—According to Grunert,² the lymphatic vessels of the median half of the eyelids accompany the vena facialis anterior to two of the submaxillary glands, which lie along this vein at the inferior border of the inferior maxillary bone. The lymphatics of the lateral half of the eyelids drain into the parotid lymph-glands. In both lids superficial and deep vessels are found.

MISCELLANEOUS.

Deformity of Neck.—Funke³ reports a peculiar and interesting bilateral congenital deformity of the neck, which was present in a girl 15½ years of age. The deformity consisted of a wing-like fold of skin, termed pterygium colli, which extended along the lateral aspect of the neck, from the mastoid to the acromion processes. After removing the same it was seen that its two surfaces were not adherent, and the normal condition of the fascias and muscles in these parts otherwise prevailed. The ears on both sides had a congenital low position, their upper border being at the level of the palpebral fissure, while the lower border was at about the level of the mouth. The ears were also placed obliquely, so that the antihelix lay anterior to the helix. Funke attributes the occurrence of this anomaly to amniotic adhesions, and not, as in a similar case described by O. Kobylinski, to atavism, in accordance with the Darwinian teaching.

Wing-like Fold at the Elbow.—The occurrence of a winged fold (*Flughaut*) in the elbow similar to those which have been occasionally found at the knee has as yet not been recorded. Wilms⁴ mentions an

¹ Intern. Monats. f. Anat. u. Physiol., XIX, 77, 1902.

² Arch. f. Augenheilk., XLVIII, H. 2, 189.

³ Deut. Zeitschr. f. Chir., LXIII, 162.

⁴ Münch. med. Wochenschr., XLIX, 12, 503.

anomaly of this kind which was not alone present in the father, but which had also been transmitted to the son. In the latter, however, it was not marked. The winged fold in the former was bilateral and hindered the movements of the elbow-joint so that it could not be extended beyond a right angle. A portion of the biceps and also of the triceps were missing, and a posterior subluxation of the head of the radius was also noted. The cause of this anomaly is, according to the writer, not to be sought in any external agencies, such as amniotic bands or a deficiency in the amniotic fluid. In all cases in which these winged folds have been observed, in the knee and axilla, muscular defects were also present. These muscular defects were always situated centrally to the fold. Whether these merely accompany the anomalous fold, or whether they are a causative factor in their formation, cannot, it is said, be as yet definitely determined.

Caudal Appendage.—D. Sernow,¹ in a male 24 years of age, described a caudal appendage of conical shape and 6 cm. in length, arising from about the level of the first sacral vertebra. The appendage was wound spirally, had a lateral direction, was covered with hair, and as a whole had the appearance of a pig's tail. On amputating the same it was found to consist of integument and adipose tissue, all traces of muscular and osseous tissue being absent. The appendage is classed among the soft or pseudo-tails, its origin being closely associated with a cleft in the vertebræ. The probability of its being derived from a hernial protrusion of the meninges, the result of increased intracerebral pressure, and which has for its covering integument and adipose tissue, is advanced, but not definitely asserted.

Cervical Auricles.—Under the heading of bilateral congenital cartilaginous remains of the neck Engelmann² describes an anomaly which English nomenclature usually terms cervical auricles. In a male 20 years of age two symmetric bodies, the size of a hazelnut, arose from about the middle of the sternomastoid. The skin was freely movable over them, but their deeper portions were attached to the underlying fascias. After extirpating one of these cartilaginous bodies the microscopic examination revealed an interior consisting of elastic and a periphery of hyaline cartilage. The perichondrium surrounding this cartilaginous body was densely adherent to both the adjacent fibrous and muscular tissues. The bilateral occurrence of congenital cartilaginous remains in the neck is stated to have been observed in but 3 recorded cases and the unilateral in 17 cases. In the case described the father of the patient is said to have had two similar bodies in the identical position in the neck. For the occurrence of this congenital anomaly the theory that it is dependent on a separation and displacement of a part of the branchial arches is refuted. Atavism, it is held, plays an important rôle in the causation of this pathologic neoplasm in man, which in certain of the lower animals, sheep and pig, is frequently normally present, and in the goat almost constantly. One of these cervical appendages of the goat which was examined microscopically bore a very

¹ Vortr. geh. in d. Kais. Naturforsch. Ges. z. Moskau, 1901.

² Berl. klin. Woch., xxxix, 27, 638.

close histologic resemblance to the specimen obtained in the case described.

Fistula Ani Congenita.—K. Bartholdy¹ describes an anomaly of the anus, fistula ani congenita, which acquires interest from the fact that its derivation is attributed to the remains of the posterior portion of the blastopore (Urmund). During the operation of an acquired fistula of the anus, in a male 53 years of age, a second fistulous tract extending from the rectum to the exterior, and completely lined by a pinkish mucosa-like membrane, was discovered. In this fistulous tract, which was extirpated and microscopically examined, no traces of fibrous tissue existed, so that inflammatory processes could not have contributed to its formation. Its lining membrane consisted of several strata of flattened epithelial cells similar to that of the integument. Near its internal orifice an aggregation of large vesicular cells of peculiar configuration, which intimately resembled the embryonic cells of the chorda dorsalis, were discovered. In view of these facts, although the fistula had not an exact median position, Bartholdy adduces that the only logical assumption for the genesis of this channel is that it was derived from the remains of the posterior portion of the blastopore.

E. Baelz² describes the peculiar blue spot of the integument which is found in the Japanese over the sacral region. It appears in the fourth month of fetal life, and persists to the seventh year. According to Nansen, the Eskimo child also has this spot, which fact leads Baelz to class the Eskimos with the Mongolians, regarding this blue tegumentary spot over the sacral region as characteristic of this whole race. Aggregations of long, spindle-shaped, and stellate cells in the cutis containing brown pigment are said to be the cause of this spot.

¹ Arch. f. klin. Chir., LXVI, 956.

² Zeitschr. f. Ethnol., XXXIII, 21, 166.

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CONTRIBUTORS

Samuel T. Armstrong, M.D., Ph.D., New York.	Charles Harrington, M.D., Boston, Mass.
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